

Vol. 3, No. 2

June, 1961

AACE BULLETIN



IN THIS ISSUE: Cost and the Learning Curve Convention Program – Boston
Workshops on Cost Estimating 1961 Membership Directory



BULLETIN

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Published quarterly by AMERICAN ASSOCIATION OF COST ENGINEERS, Durham, New Hampshire. Single copies, \$1.50. Subscription rates: United States and Canada, \$5.00 per year; all other countries, \$6.00 per year. Printed in the U.S.A. Copyright, 1961, by AMERICAN ASSOCIATION OF COST ENGINEERS. All rights reserved. This magazine, or any part thereof, may not be reproduced in any form without written permission from the publishers.

PUBLISHER
Edward D. Shanken

EDITOR
Roslyn Gitlin

CHAIRMAN, PUBLICATIONS COMMITTEE
James G. Hoyt, General Electric Company
San Jose, California

AMERICAN ASSOCIATION OF COST ENGINEERS
University of New Hampshire
Durham, New Hampshire

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Notes

from the Editor

With this issue begins what I hope will be a long and fruitful association between the AACE members and the new editor of the *Bulletin*—me, Roslyn Gitlin.

As a matter of fact, if the cooperation I've received to date from people like Ed Shanken, Buck Rodgers and Jim Hoyt is any indication of what I can expect from the rest of the membership, my job load's been lightened considerably.

If it hasn't been called to your attention before (and I'm almost certain that it has), your *Bulletin* is a product not so much of the editor, but rather of you, the members. The editor is the agent through whom your wishes, articles, information are technically executed.

Should plans for future issues materialize, we hope to change the face of the *Bulletin* by introducing a new format and some new features. All these, we hope, will make for a more vital and interesting publication.

Therefore, please feel free to criticize; make suggestions, recommendation on what you see or don't see on these pages. I need all the help you can give me.

See you in Boston.

Cover: Operator sits at computer control console in the master control room at Monsanto's Barton plant. Processing data on the ammonia manufacturing operation issues from automatic typewriters linked to complex electronic equipment. Typewriter on table records selected signals which the computer might send to various controls along the process line; and also any orders fed into the system by operators. Long carriage typewriter atop console cabinet is "logging machine" which taps out instantaneous reports on operating conditions along process stream.

Message from the President



Charles R. Hirt

The Procter & Gamble Company
President of AACE

Now that Spring has sprung and the birds are back singing in the sunlight, we too can take a look at the bright side of life.

The seeds of our 1961 objectives have been planted. With careful cultivation eliminating the weeds of distraction, and the proper nourishment of cooperation and hard work, the seedlings will be able to gain strength and come to fruition, bringing to all the members a rich harvest in the near future. The details of our program are discussed in the minutes of the February board meeting which you will find in later pages of this issue of the *Bulletin*.

The program we have outlined for this year is not lofty or theoretical, but contains some basic, practical objectives that we feel are necessary for the success of the organization. We intend to focus effort on a few problems that need solution, rather than attempt to tackle all of the possible areas to which the AACE could contribute. We feel that we can be effective if we establish some priorities and concentrate on a few jobs—and do them well.

The board has selected able, experienced and hard-working men to handle the various committee assignments and I am confident they will get results.

One of the biggest factors influencing our future program and the potential service which we can offer to one another is the time we can or are willing to contribute to the good of the Association. Cost engineers, I believe, as a group know that time is our scarcest and most perishable resource. Our occupations are so demanding on our time that we have difficulty finding the hours to do things not directly associated with our daily assignments. We all know from our own experiences that ten or even twenty periods of ten minutes each, spent on some important assignment are rarely as productive as an hour spent in one concentrated chunk. I hope that all of you who are work-

ing on some AACE assignment will therefore be able to make a few concentrated chunks of time available. This is always possible with careful planning. And applying this time in an environment of concentration and reflection will be sure of producing effective results which we need to make our Association flourish.

It has been my very great pleasure during the past several months to visit our regional sections in Boston, Chicago, San Francisco and Los Angeles. The Los Angeles meeting was the first official meeting of the new Southern California regional section. From the size of the turnout that night at the Engineers' Club, and based on the splendid distribution of members among various companies and fields of interest, I am sure that it will mature into a very successful section.

I am happy to report that all of our sections are showing strength and are holding enthusiastic meetings. With the kind of activity I have witnessed, I am sure that all are in healthy condition. I hope to have the opportunity to visit the other regional sections before the year is out. I also hope to encourage the other officers and directors to participate in similar visits—not only this year, but also in the future.

We have now filed the application (mentioned in my last report) to join the Engineers Joint Council. And I hope to have some further information for you on this subject by the June meeting.

Speaking of the June meeting, I would like to express my appreciation to Tom Drisko and Buck Rodgers for their prompt and effective work in response to my call for help. Bill Clark, our vice-president and general chairman for the 1961 meeting, suffered a coronary shortly after our February board meeting and it was necessary to look for help in a hurry.

In response to my request, Tom and Buck both gracefully accepted emergency assignments. Tom is functioning as assistant general convention chairman to Bill and Buck has taken over as technical program chairman. By the grace of God, Bill Clark is now well back on the road to recovery, and our June meeting is successfully organized and ready for all comers.

Through the hard work of Harold DeLamater, local arrangements committee chairman, and the able assistance of his cohorts in the New England section, Boston is ready; the lamp is lighted.

I hope that you will all be able to attend this fifth anniversary meeting. As they used to say to us in England during the war, "You cawn't miss it!"

Cost and the Learning Curve

Edward C. Keachie, University of California, Berkeley

Just what is the cost significance of the so-called "learning curve?" Its more correct name, "manufacturing progress function," implies that as production builds up, unit costs will decrease. They do decrease, and in a very special way not revealed by other techniques. This is particularly true in the case of those products having many parts or subassemblies.

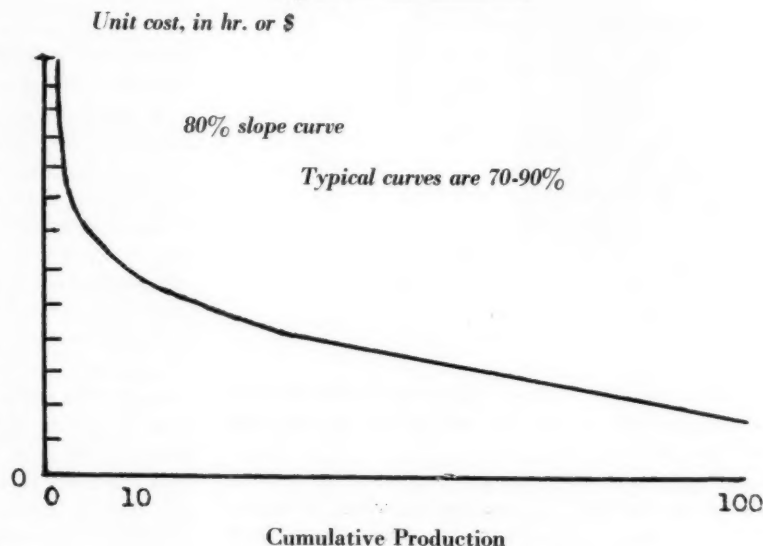
The special way that cost reduction takes place has been the basis for large dollar commitments by companies concerned. Estimates for pricing and capital budgets have leaned heavily on the progress curve idea; contract bids have been tied to it.

Beginning with the airframe industry (before World War II), many companies and some researchers have studied the theory and practice of the curve. Yet the whole topic is still somewhat of a sleeper in the thinking and practices of companies and even industries who stand to profit by it.

A material question is, "why?" Is the progress curve regarded as some kind of trick? Or is it incompatible with traditional (and therefore, respectable) accounting, engineering, production and management practices? Whatever the

The author is an electrical engineer who holds graduate degrees in business from both Harvard University and Stanford University. He has lectured extensively on industrial engineering and management, both here and abroad. Since 1949 Dr. Keachie has been a member of the faculty at the University of California (Berkeley), where he currently holds the position of associate professor of industrial engineering.

Figure 1 - Arithmetic Grid



reason, those who cash in on the progress curve will be those who check the possibilities early, not those who wait until the competition does it for them.

Two aspects of the learning curve or model are of special interest here: Products and industries most affected and kinds of information and improvement likely to result.—

- Products, industries and characteristics—airframe, transportation equipment, machine tools, automotive, housing, electronics, complex products, involved mechanization, tooling refinement frequent design changes, long cycle times, considerable assembly time. (Apparent contradictions may exist due to varied possible combinations, e. g., either small or large total quantities).

- Information and improvement areas—engineering, design, tooling,

suggestions, methods, standards, training, job design, organization, management and supervision know-how, estimating, pricing, bidding, budgeting of manpower, equipment, space and activity, planning, scheduling, purchasing, cost prediction, cost reduction and control.

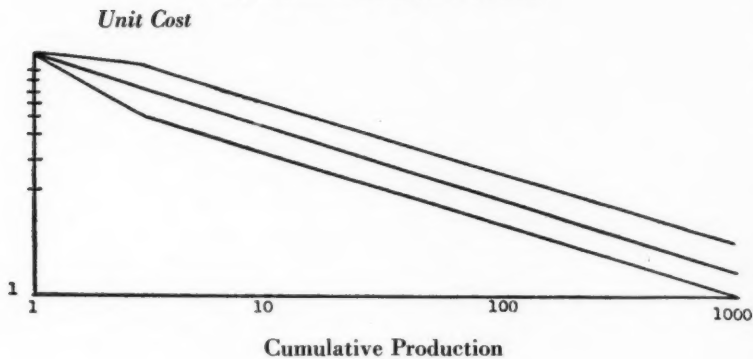
THE MODEL

A glance at typical learning curves will tell the story quickly. Let's look at Figures 1 and 2, noting that actual curves won't be as smooth.

Figure 1 highlights productivity increase and importance of early unit costs in low total production. In this curve $y = ax^b$; "a" and "b" are parameters of the particular job. The % slope shows the unit cost of doubled production, y_{n2} , compared with initial quantity, y_{n1} . Thus $y_{2x}:y_x$ 80%; "b" —0.322.

Figure 2 emphasizes regularity and possible large savings in high

Figure 2—Log-Log (Ratio) Grid



total production. In this figure "A" is the unit curve; "B" is the cumulative average curve; and where "A" is the cumulative average curve "C" is the corresponding unit curve. $Y = ax^b$, where Y is the cumulative average unit cost.

In summarizing the uses of these figures, we find that prediction of unit times or costs and other items of information and improvement (as listed above) can be made. Prediction is based on the slope and cost at one or at two points, estimated from past experience on like work, and/or checked from actual progress.

Optimal incentive standards can be set by using interim values during rapid progress, and adopting permanent standards when improvement becomes negligible.

CURVE ANALYSIS

For a rapid analysis, we must answer two questions: What does the learning curve or model tell us? How does this differ from what we already know about cost reduction?

As to the first, the curves say that unit costs drop rapidly at the start of production and continue to drop in a predictable way. The unit curve shows that as the total quantity of a model manufactured

for the first time doubles, the cost in money, direct labor hours or machine hours of the $2n^{\text{th}}$ unit will be some fixed percentage of the n^{th} unit cost.

The cumulative curve is another way to handle the same information and shows that each time the total quantity of units doubles, the cumulative average hours or cost is a constant percentage of the cumulative average hours or cost of the quantity doubled. Therefore, we can predict the unit or average costs for any point if we know or can estimate the costs at another point—and if we have an experience basis for the % reduction of the type of product involved.

How about the differences? Does the model offer any rewards we can't get just as well with our present tools? Ultimately, if it does not, the product is such that no improvement is possible in either production or costing. But for many products a plot of the progress curve may reveal the need and provide the basis for updating unit time or cost standards, and all the things based on them—in the last analysis, the unit costs themselves.

NATURE OF THE CURVE

To see what creates the makeup of

cost reduction shown by learning curves, let's consider the nature of the progress function.

At times its findings will contradict conventional cost figures relating to fixed and variable costs, breakeven point, production planning and scheduling, product mix, lot size and time standards. Fortunately, there is a growing industrial awareness that a company's own experience can be fully used to relate traditional methods to the facts brought out by the progress model. Newer books on estimating and accounting call attention to integrating the two; published articles in industrial engineering and other disciplines help to point the way.

Progress is the result of influences that favor rapid achievement of minimum time or cost. These influences or factors have been broadly grouped into two stages—pre-production and production.

- Pre-production factors—Stress engineering design, tooling, methods planning done before production starts.

- Production factors—Concerned with changes in pre-production influences as well as factors involving learning, e.g., organization, training, incentives, better continuous planning, integration of people and facilities into an improving system.

Effective action in pre-production cuts both the need and the possibility of reducing time in the production stage. Some authorities even hold that a steep progress slope in production is a reflection of inadequate work in pre-production. In fact, the general state of the art and immediate basic conditions will dictate the limits of pre-production activity.

Whatever the cause, it is true that the more a situation requires in-production attention and change, the steeper the progress curve becomes. Therefore, progress itself also increases in importance; use-

fulness of the progress function as a tool is emphasized. This is why, for example, assembly and test show higher slopes than simple, largely machine-paced production operation. Likewise, frequent modification or redesign contribute to slope or make it necessary to start again on the curve from a new higher cost or man-hour level.

Relatively static products or industries, especially where standards are accepted by all parties, may show little progress. But with rapidly developing products or industries the curve may be the best single key to their cost experience.

LEARNING CONCEPT

Learning is a crucial factor. But its nature isn't just the obvious one of operator learning. A part of operator learning is physical—rhythmic development of the best motion pattern. Another part is mental—from simple perception and response to decision making. Beyond this, the operator is part of a complex system.

In addition to his job activity, he is involved by the system in instructions, standards, scheduling and varied relationships. Job duties may change or the operator may be moved to a different station calling for relearning.

Such changes result from the activity of other persons and the impersonal requirements of the production system. As examples we can cite the designer and his modifications, the planner and his schedule changes, the manager and his decisions, the employees who cause change by their activities and absences. Change is the order of the day. It includes learning or progress by all hands plus the overriding progress of the organization as a whole.

Relationship between the difficulty of the over-all task and the ability of the organization to perform it will help to determine the improvement rate. Total learning is evidenced by

better coordination, fewer delays in personal and mechanical interactions, higher yield and quality level, reduction in accidents and other stoppages, more production.

CONCLUSIONS

The opportunity to predict costs is a primary objective and result of this method. This is especially true where the product has the characteristics given earlier, where it is new or changed, where processes require much debugging. This is because there will be a longer period of refinement in design, tooling, direct and indirect labor skills, flow, parts supply, staff and line performance.

Although operator learning has been used as a springboard in this discussion, it may be of minor importance in many cases. But automatic production, too, can show a significant progress curve over many months with little or no direct labor involved.

Thus the progress function or learning curve may apply importantly even in situations that don't seem, at first glance, to be subject to it. That is why each single management should be alert to the possibilities; they concern the way each company handles its factors of production.

By studying its own experience figures, each company can improve its effectiveness. One method of study is life-cycle analysis. In addition to direct input and output figures, a concurrent log is kept of all changes to determine their effects on the actual progress curve. By pooling the findings of individual companies, large and small, additional and possibly more significant ideas can serve industry as a whole.*

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* Readers who are interested in cooperating in such a research project are invited to write to the author for a life-cycle study guide and explanation.

Houston Workshop: A Review

At the 1960 Annual Meeting in Houston, some dozen workshops were conducted in cost estimating.

As we go to press, we have neither

the full transcripts of the workshops nor brief reports on all of them. However, the Board of Directors feels that some summary—no mat-

ter how brief—would be of value to the members.

Hence, we are offering those summaries received to date.

Building Cost Estimating

W. G. Clark, Dow Chemical Co.

The principal effort of this group was directed toward exploration of what this sub-committee should attempt to do on a long-range business.

The following main subjects were discussed: building classification, types of estimates, estimating methods, take off and pricing, chart of accounts, job cost, overhead.

Building Classification

- Industrial — warehouses, manufacturing assembly, foundries, shops. Special—refinery and chemical process towers (those structures whose principal function is the support of equipment and not the enclosure of space).

- Institutional — schools, hospitals, churches.

The above classifications should cover the field for the normal needs of the AACE membership.

TYPES OF ESTIMATES

Order of magnitude (by owners only, not contractors)—10%, 40%, Preliminary—±3 to 5% with definite limitations.

Contract or authorization±bid estimate or fund appropriation.

While discussing methods arriving at rough evaluation type estimates, an interesting thought was mentioned and should be the subject of more AACE study, namely: What is the normal floor space requirement per person for various types of activity.

ESTIMATING METHODS

Unit cost—area.

Unit cost—volume.

Segregated cost.

Detail take off.

The first two methods are not tools for the novice. Any unit cost method relies 100% on the next job being an essential duplicate of previous work and what may appear to be minor variation may often be very significant, costwise.

The segregated or "square foot of cost" method by C. A. Miller and Condon and Associates is the safest tool for the estimator who must come up with a reliable figure in an unfamiliar field.

TAKE OFF AND PRICING

Concrete—(full detail, excavate, form rod; or \$ per c. y.).

Carpentry.

Electrical.

New techniques—clerical assistance, wall technique, dictaphone.

The main problem here is unit labor cost to apply to the various items. AACE could help in this area by setting up a task force to prepare definitions on what is a unit of work.

CHART OF ACCOUNTS

Owner.

Contractor.

This is a must and could be the same for contractors and clients. An abbreviated chart—including accounts for building, site preparation, foundation, floors, walls, roofs, lighting, heating, plumbing, engineering and architect, overhead—was presented for consideration. Discussion centered around the purpose of a code rather than the specific adequacy of the one presented. The code's purpose is to put us on a common plane and enable a more

accurate and rapid exchange of information.

JOB COST

There is a very fine line between job costs not proratable into a specific item and overhead. We believe clarification could be achieved if the following method of estimating were adopted:

Direct cost	\$.....
Job Cost	\$.....
Overhead	\$.....
Job total	\$.....

Direct cost will include all labor, material and subcontracts directly associated with a specific item in the code of accounts. Job cost will include payroll taxes, supervision, first aid, consumable supplies, equipment rental, small tools, construction shack, sanitary facilities, job on-and-off changes, building and business permits, job office expense, surveying, subsistence, insurance and transportation.

OVERHEAD

Time and money spent in attending the Texas meeting were justified by W. Trotter's proposed definition of overhead, "Overhead is that cost incurred on a project whether the project is built or not." All other costs which occur as a direct result of project construction are classified as direct or job costs.

We unanimously recommend that the AACE place a high priority on the development of a chart of accounts. It will be an extremely beneficial document and the beginning of mutual understanding among our membership.

Cost-Capacity Curves

W. E. Hand, Shell Development Corp.

The subject was illustrated by circulating a copy of the March 1960 *Bulletin* which showed a graph of total plant construction cost vs. rated capacity, for sulphuric acid plants.

Discussion was directed toward finding the answer to three questions: How frequently and for what purposes do you use capacity-cost curves? What types of cost information can be shown on capacity-cost curves and what form or arrangement is preferred? What is the next step in carrying out this program?"

Participants reported using these curves for:

- Comparing relative profitability of a proposed plant installation at several different capacities. Frequently one size is estimated and costs at other capacities ratioed using the slope of published capacity-cost curves for similar plants.

- Determining operating costs at less than maximum capacity.

- Total battery limits costs of refinery units and also for segments of a complete unit such as a fractionation system, reaction step, heat medium system, refrigeration unit.

- Producing pipe line gas from coal. In long-range studies of this process, it has been found necessary to evaluate several different processes over a wide range of capacities. These operations are novel; therefore published data on complete plants don't apply. Only prices on specific equipment items are of much use in this instance.

Capacity-cost curves were suggested for battery limit costs of complete plants; costs of segments of plants or unit operations; costs of individual equipment items; maintenance costs vs. plant capacity and vs. operating rate (as % capacity); operating cost vs. plant size and vs. operating rate (as % capacity).

Opinion was divided as to the best method of presenting information on cost capacity curves for battery limit installations. Some felt that all curves should specify, in considerable details, what is and isn't included. Others argued that to clearly define any one point on a curve would take up most of an 8½ x 11 page; and to require a full description of each plant would restrict the amount of data available for publication. All agreed that the reader will have more confidence in a plot showing 20 or 30 points than in a line drawn through only two points.

It was agreed that the AACE should:

- Canvass the membership to determine some of the plants, processes or unit operations for which cost-capacity curves are needed.

- Promote a uniform basis of reporting battery limits plant costs.

- Review published data, examine reliability, supplement from private sources where necessary and possible, plot all points that appear reliable on 8½ x 11 charts. Charts should be published in the *Bulletin*.

Although several types of equipment are being studied by other groups of the Capital Cost Estimating Committee, there is a need for much more work in this area. Operating costs and maintenance costs fall in the field of the Operating Cost Estimating Committee and we suggest that Mr. Hegerty add these items to the list of projects for this committee.

Depreciation Accounting

J. Irwin Peters

This workshop dealt with the difficulties inherent in, and the possibility of improving, the present system.

Depreciation is the result of wear and tear as well as technological and product obsolescence. And depreciation accounting is a method devised to allow for replacement of equipment; recovery of investment as part of selling price is the technique used. The government fixes the useful life for equipment of various types. This useful life has nothing to do with the condition of the asset, and refers only to its usefulness for the intended purpose. It is therefore highly subjective with industry and government frequently differing in their estimates. The common term, "depreciation fund," doesn't refer to a separate fund; it exists for bookkeeping purposes only.

What is the equitable basis for depreciation? Should the original historical cost of a capital asset or the replacement cost of the asset be

recovered by depreciation allowance?

Major arguments in favor of the historical cost method were:

- It's the only method which fits in with the accounting definition of depreciation and the purpose of the depreciation allowance.

- It's almost impossible to determine the replacement cost of equipment because of varying costs and technological changes. No proper basis for the replacement cost concept therefore exists; its administration would be very difficult.

- Using replacement cost as basis will aid inflation.

- Existing companies in a field and larger firms will be favored over new entries and smaller enterprises.

The constant rise in costs and restrictive government tax regulations were considered the outstanding factors necessitating consideration of replacement cost depreciation.

Opinion of the meeting was un-

animous in favor of liberalization of depreciation tax allowance. Canadian, British and Swedish tax laws, and those in the common market countries, were discussed briefly and found to add an incentive to capital investment. All permit greater flexibility and much more rapid write-off than U. S. tax laws. And rapid write-off permits companies to reduce the impact of inflation on their capital, while greater flexibility permits companies to schedule depreciation charges.

The impact of rapid write-off and the consequent delay in tax pay-

ments on government receipts were discussed. It appeared that little change in receipts over an extended period would result. However, some economists have calculated that the government's receipts will be affected, noticeably, by a delay in tax payment resulting from rapid write-offs. Although many legislators in Washington object to the practice of some companies having two sets of books—one, for tax purposes; the other, for financial reports to shareholders—those at the workshop felt there was nothing wrong with this practice as long as the

complete picture was conveyed to the shareholders in some manner.

Conclusions: Liberalized, accelerated depreciation, i.e., faster depreciation rate than presently allowable, is most desirable as an incentive for capital investment and to offset losses due to inflation.

We recommend that the AACE circulate a questionnaire on depreciation accounting practices to the members. Publication of the results of such a study would aid in effecting a change in regulations and enhance the reputation of the Association.

Cost Index

Bernard J. Gaffney, Wood Conversion Co.

A survey of interest and cost index used turned up the following:

- Specific uses were to correct or adjust costs in relation to time factor, type of structure or design, geographical location.
- Adjustments were determined relative costs of a facility, items of equipment, labor materials.
- End use of adjustments were for estimating erected costs, estimating cost of equipment, valuation for insurance, tax or other matters such as appraisal for purchase.

We discussed the complex basis used in deriving present indexes, many of which incorporate other indexes. Use of separate indexes for different phases of a given job might not give a meaningful total figure for the job.

Apparently there is a need for an index for electrical components of a facility.

The many classes of construction indexes vary from those for type of building or equipment therein to gross indexes for types of industrial activity. A look at a number of these didn't indicate what confidence might be attached to the indexes. Figures given are reported to apparent absurd degrees, indicating

accuracies or dependabilities of tenths of a percent. Since the figures are all weighted averages of one kind or another, the degree of confidence within limits would be a much more realistic way to report.

One discussion indicated that the product of labor rate and productivity might be fairly constant for some geographical locations. It was thought also to be a function of the state of development of a country or area.

Indexes relating construction units per man hour seem to be a basic need.

The members in attendance felt that the Index Committee should work with those issuing present indexes toward establishing better and more uniformly reported and meaningful figures. Before directing specific attention to specialized fields, research might be initiated as to the needs and development of basic methods of approach and statistical interpretation of survey data.

Indexes other than those relating to construction activity weren't discussed. They should, thinks the moderator, come under the activity of the Index Committee.

Cost Estimating Course

Ralph E. Barker, Continental Oil Co.

The fact that a problem in cost estimating training really exists is best illustrated by the following needs:

- Management demands for more, faster and more accurate cost estimates continue to grow.
- Individuals who can supply sound judgment in the selection of equipment and labor for a project—with only a flow diagram and equipment specifications—are scarce.

• Growing use of the computer requires more people who know all the fundamentals that are necessary to assemble reliable cost data.

• All engineers are required to use more economy in their designs. They should therefore be exposed to fundamentals used by the cost engineer.

A basic training course, one designed to develop and present basic fundamentals, is the best way to

start training in the right direction. It could be applicable to both new employees in the estimating section and experienced engineers who need the services of the cost engineer. But it must also be supplemented by experience from actual field construction and serving an apprenticeship with experienced estimators. Ultimately, the development of a qualified estimator depends on the individual trainee.

Keeping the above in mind, we believe that our short course be built around a plan which includes language or nomenclature, tools of the trade and their use, estimating methods and classification, case studies, field trips, problem-solving sessions.

Who should teach the course? An experienced estimator and a qualified instructor, together, should plan and present it. The instructor

would have the necessary personality and qualifications to get across the basic information. The estimator would have the necessary experience to present the details of the major subject matter.

We unanimously recommend that one of the AACE regional sections select this as a project and continue to work on a plan for such a course as we have attempted to outline above.

Computers and Cost Problems

James P. Adams, Monsanto Chemical Co.

The majority of members attending this workshop were in the chemical process industries. All present reported that their companies were using computers in economic evaluation work. Computers, all digital, range in size from large to medium. And applications run the gamut—from cash flow calculations to capital cost estimation, compilation of bills of materials, computation of optimum economic design.

The over-all impression gained by the chairman is that this is an active, but somewhat new field. Most people present were seeking

ideas and guidance from the experience of others. Mr. Jordan of Allied Chemical & Dye, made a strong plea for the AACE to set up an exchange program for computer programs in economic evaluation of the same type as the AIChE now has in the chemical engineering field. Jordan even went so far as to state that he felt Allied would assist financially with such a project. He also made the point that even if a particular program might not be usable on the computer used by another company, the program flow chart—showing approach to the

problem—would be just about as valuable as the detailed program itself in the information which it would convey.

Because of the considerable interest in Jordan's proposal, the presiding chairman wrote to Dr. Gaffney to request the formation of a new technical committee to establish such a program.

As long as the level of interest is as high as manifested at this workshop, we recommend that the workshop be repeated next year and possibly be presented in future years.

Methods of Pipe Estimating

Ray Hopkins, Monsanto Chemical Co.

Discussions in this workshop were limited to methods of estimating weight of carbon steel pipe put into existing racks. Some of the methods discussed were: Ratio of pipe to equipment, labor as a ratio of material, ratio of pipe to tool plant.

A detail estimate is the most accurate method of estimating when sufficient engineering data is available. Material and prefabricated welds can be accurately estimated. Labor pipe erection is more difficult. But since it's usually less than one-half of the total piping cost, its effect

is minimized. In detail estimate, field erection is usually detailed by units of labor operation such as cost per weld, cost per foot to erect pipe.

Ratio and other rule-of-thumb methods are valuable estimating tools when great accuracy isn't required, to make quick estimates, to check estimates and for making a detail estimate when engineering data isn't available.

One of the best rule-of-thumb methods is ratio of pipe to equipment. This method gives good accuracy when estimating a new plant that is similar to the one from which

the ratio came. It also has the advantage of being based on equipment cost which is usually the first and most accurate part of an estimate.

The amount of engineering data available often dictates the method that will be used to make an estimate. The minimum amount of engineering data required by most estimators to make a detail estimate is a plot plan and flow sheet. The method used will depend upon what the estimate is to be used for, data available, experiences of the estimator.



Board in Action: I. to r. clockwise, (around the table) A. Seekins, H. DeLamater, W. Hergerty, W. Dodge, S. Katell, B. Gaffney, T. Ponder, C. Hirt, W. Clark, D. Brosnan, J. Gorey, D. Meikle, C. Chilton. Back to camera: E. Eaves and E. Shanken.

Minutes of Board of Directors Meeting

BOSTON, MASS. (SOMERSET HOTEL)

February 13-15, 1961

The meeting was called to order at 9:00 a. m., Monday, February 13, 1961 by President Hirt. Officers and directors present were:

Charles R. Hirt
William G. Clark
Thomas C. Ponder
Cecil H. Chilton
Bernard J. Gaffney
Sidney Katell
Addison W. Seekins
William J. Hergerty
Donald I. Meikle
Edward D. Shanken, Executive Secretary

Committee chairmen and members present were:

Wesley J. Dodge
Jay M. Gorey
Don Brosnan
Miss Elsie Eaves
Frederick A. Franks

Marion W. Rodgers

Harold J. DeLamater

Minutes of the previous Board Meeting of June 11-15, 1960 were corrected and approved.

Treasurer's Report, circulated by Cecil Chilton, was approved and accepted following explanation of the Association's financial status.

Audit Committee Report, submitted by Irwin Bromberg, was accepted by the Board.

Organization Chart, indicating various lines of responsibility for sponsor directors and committee chairmen, was presented to each board member by President Hirt. Committee chairmen appointees were selected during the meeting.

Organizational Manual—Jay Gorey presented the first draft of the manual, which will be distributed to national and regional officers, directors, committee chairmen and persons with responsibility and need for it.

Certain pages will be revised annually to reflect changes in officers, directors and committee chairmen. Gorey will revise this year's manual by June 1 and send copies to all directors and officers for adoption by the Board at its June meeting.

Bibliography Committee—Scope of material abstracted for this publication is limited because of the present arrangement with the Bureau of Mines. Sidney Katell reported that a chairman and new members must be appointed for this committee. Prime duty of the new chairman will be the checking of other organizations and societies as well as various libraries for available bibliographies.

Publicity Committee—Tom Arnold, Chairman. Report included copies of news releases sent out so far as well as projected plans for the coming year.

Publications Committee—J. G. Hoyt, Chairman. Both long—and short—range goals and aims for 1961 were presented. A more detailed report with specific information on what has been done with publication of papers presented at the June 1960 meeting will be sent to board members.

Admissions Committee—Carl Clayton, Chairman. Between June 1 and December 31, 1960, 112 applications were received. These, plus 8 applications pending on June 1, bring total to 112 applications which were processed, with 8 pending at the end of the year. Of the 112, 88 were approved for Member, 24 for Associate. No applications for Student Member were received.

Membership Committee—Bill Gott, Chairman.

Current Membership	818 (1960 dues-paying)
Applications pending	57
1959 Drops	62

Membership Growth Forecast, 1960: 770 members, according to income from dues.

Regional Activities Committee—Wesley Dodge, Chairman.

Board was asked to, and did, grant charters to two new regional sections: Niagara Frontier and Southern California. Dodge predicted a total of 8 new sections by June 1961. In addition to the newly chartered sections, the others are Detroit, Toronto, Montreal, Cincinnati, Minneapolis, St. Paul and London, England.

Capital Cost Control Committee—R. Balotti, Chairman.

Balotti is continuing work on terminology while Carl Bauman is handling check lists. Work on feedback of cost data has been taken over from I. Bromberg by Glen Moorehouse.

Capital Cost Estimating Committee—Egon F. Brummerstedt, Chairman.

Communications are the real problems facing this committee. Due to lack of response to letters, representation from regional sections has not been forthcoming.

Future plans: Ad Seekins will follow up on the committee chairman's recommendations. Committee chairmen will be asked to prepare quarterly reports from all groups. The Board will then submit these and other comments to Jay Gorey for inclusion in the Organizational Manual.

Operating Cost Estimating and Control Committee—Bill Hegerty, Chairman.

A fact-finder questionnaire will be sent to the membership.

Profitability Committee—Alan Bates, Chairman. Fuller report expected at the June annual meeting. Active members in most regional sections are working on the profitability handbook.

Cost Index Committee—Glen Moorehouse, Chairman. Moorehouse will revise and improve AACE Cost Index Manual. He will appoint committee members in all regional sections and improve communications within the committee.

Cost Index Manual—Letter to purchasers has been drafted by Shanken explaining improvements to be made in the manual. These revised sheets will be sent to purchasers at no extra charge.

External Affairs Group—To be headed by Bill Hegerty.

Education Committee—Committee is presently inactive. M. S. Peters suggested formation of a new committee and President Hirt will ask H. Schweyer, U. of Florida, to head it.

Coordination Committee—Elsie Eaves, Chairman. A list of associations has been compiled and each of them has been sent copies of AACE Brochure. Some exchange of data between other organizations has been accomplished.

Miss Eaves proposed a committee member from each regional section for work and liaison. Each section will also be asked to advise Miss Eaves of Engineering Councils to which it belongs.

Boston Meeting—M. W. Rodgers was appointed Technical Program Chairman, subsequent to Bill Clark's illness.

Technical program, local arrangements, budget requirements were discussed. Target dates for preliminary and final program mailings were set.

Regional Section Problems—Wesley Dodge, Chairman.

Since work involved in establishing new sections has been accomplished at the expense of work on regional sections activity duties, formation of a New Sections Committee has been recommended. Director—sponsor of both these committees will be Don Meikle.

Dodge proposed a charter to be presented to each regional section upon its approval by the Board as well as a standard constitution to be used by newly formed regional sections. Both proposals will be reviewed by Board members before May 1.

Committee Related Business

Publicity needs more emphasis.

Technical standards—Bill Hand's file will be turned over to Ad Seekins for editing and he will draft an appropriate presentation for inclusion in the Organizational Manual.

Committee Assignment and Follow-up—Director-sponsors and committee chairmen must follow up more closely on appointments, work assignments and objectives.

Awards and Special Affairs Group—B. J. Gaffney, Chairman.

No life memberships will be awarded this year.

Shanken will arrange for the design of the "Past President's" pin and will handle certificate to accompany the pin.

Five-year continuous service award will be handled by Gaffney who will report on eligibility of members, when and how award shall be made.

Certificates which will include proposed charter for regional sections will be handled by Gaffney. Membership certificates should be sent out within 3 months after membership acceptance. Schedule of certificate

mailings: January 1, April 1, July 1 and October 1.

Nominating Committee—B. J. Gaffney, Chairman. Chairman appointed the following committee members: A. Seekins, W. Hegerty, C. A. Miller, J. W. Hackney.

Annual Meetings

1962 meeting is scheduled for June 25-27, Edgewater Beach Hotel, Chicago, Ill. Henry C. Thorne, Jr., has been approved as local arrangements chairman. Technical program chairman has not yet been appointed.

1963 meeting is scheduled for July or August in San Francisco, Calif. Gus Anderson has been suggested as local arrangements chairman.

1964 meeting is scheduled for New York City. E. J. Gibbons suggested as local arrangements chairman.

Depreciation Study—J. I. Peters has prepared a questionnaire for use in surveying the membership on depreciation methods. Also a government survey has been completed along these lines. Bill Clark will check into the possibilities of a paper on the results of the government survey for the June 1961 meeting.

Committee Chairman Appointments—A list of suggested names for chairmen and committee members for various committees was developed. President has Board approval to appoint from this list.

Secretary will contact regional section chairmen for suggestions and recommendations from their membership for committee members.

Election and Terms of Office—Officers and Directors—Because of the difficulty encountered in transition from one slate to another slate of officers and directors, President Hirt will appoint a special committee to study the problems of election and effective dates of office for national officers and directors. Committee will also consider the feasibility of changing the vice-presidential title to Vice-President—President-Elect. Report expected at the June 1961 board meeting.

National Charter for AACE—Chilton's motion that further action on this matter be tabled was approved and seconded.

Engineers Joint Council—EJC is unaware of any British counterpart to EJC. It is also unaware of any policy by U. S. State Department on Branch Sections of Societies in foreign countries. EJC advised AACE could submit application for membership at the next EJC board meeting on May 19, 1961. Board approved motion that AACE apply for National Associate Membership in EJC.

British Group—Board agreed to suspend any final conclusion on this problem until after the June 1961 meeting where a discussion is to be held with Mr. Herbert from the British group.

Executive Secretary's Report—Ed Shanken presented his report and recommended that he be relieved as editor of the *Bulletin*.

Shanken was requested to write a job description of his duties and responsibilities and also for his secretary for inclusion in the Organizational Manual.

At the request of the regional sections, the executive secretary—as a special service—is collecting dues for the sections.

Communications, Ways and Means to Improve—President Hirt suggested that the following guides be followed:

Correspondence on items of general interest should

go to all board members.

Copies of all correspondence should go to Shanken. Chairmen and director-sponsors are primarily responsible for setting up schedules and following up on activity and results.

Progress reports from directors on their activities as well as those of the committees for which they're responsible should be submitted to the president quarterly—on January 1, April 1, July 1 and October 1.

The president will send his report to the *Bulletin* by February 1, May 1, August 1 and November 1.

Treasurer will submit quarterly reports to the president on January 1, April 1, July 1 and October 1. Additional verbal reports will be made at the annual meeting.

Before each board meeting, all committee reports shall be in the hands of each board member.

Future Board Meetings—It was suggested that two, three-day meetings would probably be needed. Next board meeting: June 20, 23 and 24, 1961 in Boston.

Bulletin—Real problem is getting material to printer on time. No backlog of material for publication is available.

All regional section secretaries will be asked to send meeting announcements to Shanken.

Publications committee will be reactivated to increase efforts in getting regional section papers for publication.

Proposed new editor—Mrs. Roslyn Gitlin of New York City has been asked to undertake the job of *Bulletin* editor. Shanken will continue to handle all contact with the printer. He will also propose suitable job description and handle all necessary training and supervision. Evaluation of Mrs. Gitlin's efforts on the June 1961 *Bulletin* will be made at the June board meeting.

Membership Directory—Directory should be published each year. Regional sections will be contacted for their directories. Cut-off date for Directory will be May 1, 1961. Normally, April 1 will be used. Membership dues date will be changed to be payable November 1 each year.

Membership Directory will be handled by Shanken.

Objectives for 1961—Outlined by President Hirt:

Improve quality and publication of *Bulletin*; improve its value to members.

Improve communications on all levels; expect and give cooperation on all levels.

More aggressive membership drive.

Organize more regional sections.

Improve publicity coverage and more action on regional and national level—including special releases to home town newspapers and college alumni publications on matters dealing with AACE news of members.

Broaden committee activity and get more active committee members. Technical committee progress must be accelerated.

Improve Cost Index Manual publication.

Complete Organizational Manual this year.

New officer and committee chairman take-over must be improved and perfected.

Try for 1961 acceptance into EJC.

Strengthen long-range plans of Planning Committee. Board approved final budget. Chilton will report on this basis at the June board meeting.

—Adjourned—

CONVENTION NEWS

Fifth Annual Convention
Boston, Mass.
Hotel Somerset
June 21-23, 1961

TECHNICAL PROGRAM

Tuesday, June 20

2:00 to 10:00 P. M.

Registration

Wednesday, June 21

7:00 A. M. Registration

Morning Session

8:45—10:15 A. M.

A-1 **Project Management**

Panel Discussion

J. W. Hackney, Pan-American Management Ltd.

A-2 **Negotiated Contracts**

Panel Discussion

K. G. Wolfe, Bechtel Corp.

R. Custer, Sun Oil Co.

L. Vining, Esso Research and Development

S. Root, Badger Manufacturing Co.

10:15—10:45 A. M.

Coffee Break

10:45—11:45 A. M.

A-3 **The Economic Choice**

C. W. Birkett, Aluminum Co. of Canada, Ltd.

A-4 **Computer Application**

A. W. Doolittle, Jackson and Moreland, Inc.

A-5 **Profitability Analysis**

H. C. Thorne, Jr., Amoco Chemicals Corp.

A-6 **Infra-red Heating**

F. Prince, Hupp Corp.

12:00 Noon—1:15 P. M.

Luncheon

Presiding, W. G. Clark

Welcoming Address: B. Fefferman

President's Message, C. R. Hirt

Afternoon Session

1:30—2:30 P. M.

A-7 **Planning and Scheduling**

D. S. Mattiza, Columbia-Southern Chemical Corp.

A-8 **Building Cost**

R. C. Turner, Facing Tile Institute

A-9 **Instrumentation**

W. I. Strauss, Foxboro Co.

A-10 **Heat Exchangers**

G. Elliot, Alco Products

B-1 **Salt Water Desalting**

K. G. Barnhill, Ionics Inc.

R. E. Siegfried, Badger Manufacturing Co.

2:30—2:45 P. M.

"Coke" Break

2:45—3:45 P. M.

B-2 **Equipment Erection**

W. O'Neil, Tampa Bay Engineering Co.

B-3 **Structural Steel**

S. Horwitz, West End Iron Works

B-4 **Electrical Estimating**

D. H. Cochran, E. I. duPont deNemours & Co.
B-5 **Cost and the Progress Function**
Prof. E. C. Keachie, University of California, Berkeley

3:45—4:45 P. M.

B-7 **Profitability Analysis**

H. C. Thorne, Jr., Amoco Chemicals Corp.

B-8 **Chemical Plant Estimating**

C. D. H. Bierman, Blaw-Knox Co.

B-9 **Cost Control**

I. D. Brown, E. I. duPont deNemours & Co.

B-10 **Fabricated Plate Work**

H. L. O'Brien and H. A. Barger, Graver Tank and Manufacturing Co.

Thursday, June 22

Morning Session

8:30—10:30 A. M.

C-1 **Critical Path Scheduling**

H. Berman, Mauchly Associates, Inc.

C-2 **Short Cut Estimating Methods**

S. A. Gertz, M. W. Kellogg Co.

C-3 **Negotiated Contracts**

Panel Discussion

K. G. Wolfe, Bechtel Corp.

R. Custer, Sun Oil Co.

L. Vining, Esso Research and Development

S. Root, Badger Manufacturing Co.

10:30—10:45 A. M.

Coffee Break

10:45—11:45 A. M.

C-4 **The Economic Choice**

C. W. Birkett, Aluminum Co. of Canada, Ltd.

C-5 **Cost Control**

I. D. Brown, E. I. duPont deNemours & Co.

C-6 **Heat Exchangers**

G. Elliot, Alco Products

C-7 **Contractual Elements—Their Affect on Cost**

R. E. Templeton, M. W. Kellogg Co.

12:00 Noon—1:15 P. M.

Luncheon

Presiding, T. C. Ponder

Nominating Committee Report, B. J. Gaffney

Afternoon Session

1:30—2:30 P. M.

C-8 **Electrical Estimating**

C. H. Cochran, E. I. duPont deNemours & Co.

C-9 **Fabricated Plate Work**

H. L. O'Brien and H. A. Barger, Graver Tank and Manufacturing Co.

C-10 **Instrumentation**

W. I. Strauss, Foxboro Co.

D-1 **Equipment Erection**

W. O'Neil, Tampa Bay Engineering Co.

2:30—2:45 P. M.

"Coke" Break

2:45—3:45 P. M.

D-2 **Piping**

J. S. McGeach, W. M. Anderson Co.

D-3 **Chemical Plant Estimating**

C. D. H. Bierman, Blaw-Knox Co.

D-4 **Structural Steel**

S. Horwitz, West End Iron Works

D-5 **Estimating Operating Cost of New Ventures**

Dr. J. H. Black, U. S. Steel Corp.

3:45—4:45 P. M.

D-6 Planning and Scheduling

D. S. Mattiza, Columbia-Southern Chemical Corp.

D-7 Building Cost

R. C. Turner, Facing Tile Institute

D-8 Computer Application

A. W. Doolittle, Jackson and Moreland, Inc.

2:45—4:45 P. M.

D-9 Pumps

E. J. Serven and T. J. Sniffen, Worthington Corp.

6:00—7:00 P. M.

Cocktail Hour—Dutch Treat

7:00—10:00 P. M.

Annual Banquet

Presiding, Dr. O. T. Zimmerman, Founder of AACE
Guest Speaker, N. V. Nelson
Presentation of AACE Award of Merit by B. J. Gaffney
Guest Speaker, Henry Bradford Washburn, Jr., Director
Boston Museum of Science

Friday, June 23

Morning Session

8:30—10:30 A. M.

D-10 Short Cut Estimating Methods

S. A. Gertz, M. W. Kellogg Co.

E-1 Critical Path Scheduling

H. Berman, Mauchly Associates, Inc.

E-2 New Horizons in Precast Concrete

A. J. Hawley, Vice-President, Fletcher-Thompson, Inc.

W. C. Pahl, President, Wm. C. Pahl Construction Co.

10:30—10:45 A. M.

Coffee Break

10:45—11:45 A. M.

E-3 Piping

J. S. McGeach, W. M. Anderson Co.

E-4 Estimating Operating Cost of New Ventures

Dr. J. H. Black, U. S. Steel Corp.

E-5 The Economic Choice

C. W. Birkett, Aluminum Co. of Canada, Ltd.

E-6 Contractual Elements—Their Affect on Cost

R. E. Templeton, M. W. Kellogg Co.

1:45—3:45 P. M.

AACE General Business Meeting

Presiding, C. R. Hirt

British Publication Open to AACE

Word has been received from John H. Herbert, English member of the AACE Publications Committee, that papers on cost engineering worthy of publication in Great Britain will be welcomed.

Any AACE member interested in publication in Great Britain should send two copies of his paper, together with a release for publication, to J. G. Hoyt, AACE Publications Chairman, General Electric Co., 2151 South First St., San Jose, Calif.

June, 1961—AACE BULLETIN

News from the Regions Chicago Midwest Section

Two concurrent workshops were sponsored by the section on April 18 at the University Club. The first, "Profitability and Operating," was moderated by Stephen H. Boll, Motorola Co. and Henry C. Thorne, AMOCO. The second, "Capital Cost and Cost Control," featured James Poole and Alfred Miller, both of DuPont Co., and E. John Mark, Pure Oil Co., discussing replacement parts inventory control.

On May 8, the section sponsored its second all-day symposium on "Capital Costs" at the Furniture Club of America. The morning program, chaired by Harold Stamps, Deleuw Cather & Co., included presentations on cost control technology, development of capital cost estimates and cost data for earthwork and concrete construction auxiliary to the main buildings and process construction.

John MacLennan, International Minerals & Chemical Corp., chaired the afternoon session on equipment costs and estimating by computers.

Potential Cincinnati Section

Eleven representatives from five companies attended the first organizational meeting of what may become a Cincinnati regional section. As a result of the April meeting, the first technical meeting was scheduled for May 25—with W. Holland, Procter & Gamble, speaking on "Critical Path Scheduling."

Delaware Valley Section

Calendar for the 1960-61 season included:

September—Dinner meeting at the Philadelphia Engineers Club. R. Lynn, Bechtel Corp., commented on a color film about construction of the Dresden nuclear power plant. Attendance: 38.

November—Dinner meeting at Philadelphia Engineers Club. "Design Planning and Profitability of New Plants" was the subject of a talk given by Dr. L. W. J. Cummings, Sun Oil Co. Attendance: 40.

January—Dinner meeting at DuPont Country Club. Following dinner, a panel discussion on "Standardization in Cost Engineering" was led by R. R. Balotti, DuPont Co.

February—Section participated in Philadelphia observance of National Engineers Week.

March—Dinner at Philadelphia Engineers Club, followed by talk on "Critical Path Planning and scheduling" at Atlantic Refining Co.'s auditorium. Guest Speaker was Walter Cosinuke, Catalytic Construction Co. Attendance: 80.

May—Two workshops were presented in an afternoon program at the Philadelphia Engineers Club. "Essentials of Cost Control" was moderated by I. Bromberg, Foster Wheeler. "Reducing Uncertainties in Budget-Type

Estimates" was moderated by R. Barron, Sun Oil Co.

After dinner, a Bell Telephone film on construction of the Distant Early Warning Line was shown. This was followed by an announcement of election results.

GULF COAST SECTION

Among the recommendations made at the April 11 Board of Directors meeting were the scheduling of a "strong technical meeting" to be held in September and an all-day seminar in November to be arranged by Duncan G. Allen.

Notable in proposed changes to section by-laws were recommendations for two awards to section members—one, for the best paper presented to the section; the other, for the most significant contribution of service to cost engineers during the preceding year. Both awards are to be presented at the annual meeting.

METROPOLITAN NEW YORK SECTION

A highlight of the sixth executive meeting of the season, held March 8 at the McGraw-Hill Building, was a report on the success of the section's trip to Con Edison's atomic power plant at Indian Point, N. Y. About 100 people, among them 50 engineers, attended.

Included in the committee's discussion for future programs was the suggestion to mail questionnaires to individual members on which they can indicate subjects of high interest value.

Sixth general meeting of the 1960-61 season was a luncheon meeting held in the Advertising Club on March 23. John W. Hackney, Pan American Management Ltd., Montreal, Can., spoke on "How to Control Capital Ventures to Maximize Profits." Attendance: 30.

NEW ENGLAND SECTION

In the words of the section's last meeting announcement, "the last blast of the season and the last before the National Cost Cat Convention was orbited on May 9. A round-table rumble, not square Dad, was held at the MIT Grad Pad, to make sure the members dug that conventional jazz the most." Also the "new, like, brass" were installed.

NIAGARA FRONTIER SECTION

Last membership meeting of this season was held on May 8 at the Boots and Saddle Restaurant, Niagara Falls. Agenda for the meeting included installation of newly elected officers and program planning for the 1961-62 season.

NORTHEAST OHIO SECTION

Both the April and May meetings featured workshop programs. The April 6 workshop, "Costs of Process Equipment," was led by Frank G. Flocke, Vice-President, Thornton Co. The May 4 workshop, "Cost Estimating and Control," was under the leadership of W. J. Hegerty, Executive Vice-President, Colonial Iron Works.

At the April meeting, the following section officers were elected for the 1961-62 season:

<i>President:</i>	H. H. Huttenlocher
<i>Vice-President:</i>	F. G. Flocke
<i>Secretary:</i>	P. R. Sayre
<i>Treasurer:</i>	C. L. Copple
<i>Board Members:</i>	H. Spencer
<i>(Two Years)</i>	V. C. Squires

PITTSBURGH SECTION

Two Board of Directors meetings were held this spring—one, in March; the other, in April. At the March 30 meeting, A. W. Seekins reported on highlights of the national directors' meeting and recommended that the section's position on selection of members and procedures for functioning of national committees be brought to the attention of the national president.

Except for Wes Dodge's suggestion on the acceptance of the standard section constitution, all other recommendations for improving inter-sectional cooperation were approved by the section board.

On April 25, a joint meeting of the new and retiring boards was called by the president-elect.

On March 8, following a social hour and dinner at the Cork and Bottle, a business and technical meeting was held at the Koppers Building.

At this meeting results of voting on proposed amendments to section by-laws and balloting for officers for 1961-62 were announced:

<i>Amendments</i>	Approved
<i>President</i>	J. F. Rigatti
<i>Vice-President</i>	C. D. H. Bierman
<i>Secretary</i>	R. Karns
<i>Treasurer</i>	D. R. Lindahl
<i>Director-at-Large</i>	J. T. Connell

A three-meeting seminar on "Computer Applications to Cost Engineering" was introduced after the business meeting. Dr. P. Zaphyr, Westinghouse Electric Corp., spoke on fundamentals of digital computers.

The March 22 meeting, again conducted by Dr. Zaphyr, dealt with planning and scheduling and with simulation.

On April 5, the final session, on use of computers to control industrial processes, was conducted by R. O. Decker, Westinghouse Electric Corp.

Plan to attend

5th Annual AACE Meeting
Somerset Hotel, Boston
June 21-23, 1961

What's Happening . . .

E. Armbruster is now general superintendent of the construction department, Brown & Root Ltd., Montreal Can. He was formerly associated with the Fraser-Brace Engineering Co. Ltd., of the same city.

Alf L. Carroll, former project comptroller for the engineering and construction department of Union Carbide Metals Co., Niagara Falls, N. Y., is now completing the second year of an overseas assignment with the International Cooperation Administration as advisor to the Korean utilities and the various ROK government agencies concerned with electric power. There is a good chance that he will accept another assignment in Korea for a second two-year period.

Kenneth W. P. Cheng is now estimator for Walter Kidde Constructors, Inc., New York. He was formerly employed by Frank W. Bogert, Inc. of the same city.

Herman L. Childress, who was previously assistant to the president and manager of economic analysis for the California Oil Co., Perth Amboy, N. J., has been transferred to Standard Oil Co. (Calif.) in San Francisco, where he will be assistant to the vice president.

Walter S. Craig is presently engineering estimator in the production engineering department of the Philadelphia Gas works in Philadelphia, Pa. His previous position was that of cost and progress engineer in the construction department of M. W. Kellogg Co., N. Y.

Gustav Enydey, Jr., who was formerly in the soda products division of Diamond Alkali Co., Painesville, O., has been transferred to the central engineering department of the same company in Cleveland.

Jay V. Fetterman is now administrative manager of the defense and space division of Air Products Inc., Allentown, Pa. His previous position with Air Products was as manager of the sales service department.

Charles E. Fortenbaugh has been transferred to the national headquarters of Diamond Alkali Co., Cleveland, O., as a cost estimator in the central engineering department. He was in the plant maintenance department of the Painesville, O., branch.

William J. Funk has been promoted from assistant sales manager to manager of foreign products for Arthur G. McKee & Co. of Cleveland, O.

Stanley A. Gertz, former supervisor, systems development group, M. W. Kellogg Co., N. Y., is now manager of the computer operations division of the same company.

Gene E. Hamilton has been promoted from research engineer to manager of process analysis in the research and engineering department of the Sun Oil Co., Marcus Hook, Pa.

Richard C. Hermann, who has been resident engineer on construction of an aluminum fabricating plant built by Northern Aluminum Co. Ltd., Auckland, N. Z., for the

past two years, has returned to the head office of the Aluminum Co. of Canada in Montreal.

C. Edward Hollenbeck, former engineer-estimator for Kaiser Engineers in Oakland, Calif., has been transferred to the Richland, Wash., branch of the same company as senior electrical engineer in the electrical engineering department.

Reginald K. Hoon, who has suffered a heart attack, has been forced to curtail his activities and limit his responsibilities. Formerly supervisor of the cost engineering department of Dravo Corp., Pittsburgh, Pa., he is now assistant supervisor of the same department.

Millard L. Hosfelt, assistant manager of estimating for Fluor Corp. Ltd. of Los Angeles, Calif., has been temporarily assigned to their affiliate, Singmaster & Breyer in New York, as chief estimator.

Robert D. Karns is now senior process engineer for Mobay Chemical Co., Pittsburgh, Pa. He was previously chemical engineer for Bituminous Coal Research, Inc., of the same city.

Frederick F. Kircher, of the cost control department of Foster Wheeler Corp., N. Y., is currently in the London office of the corporation to help set up a cost control department there.

Thaddeus C. Lish has a new position as head engineer in the refinery estimating department of the American Oil Co., Whiting, Ind. He was previously associated with the Standard Oil Co., Hammond, Ind., as assistant head engineer in their estimating department.

John I. Malpass has accepted a position as estimator and specification writer for the engineering division of J. H. Pomeroy and Co. Inc., San Francisco, Calif. He was formerly chief estimator in the estimating department of Indenco Engineers, Inc., San Leandro, Calif.

Louiz Dallavia, former manager of his own company of cost estimating standards consultants in Houston, Texas, is now associated with Hunkin-Arundel-Dixon, prime contractors of Silver Bay, Minnesota, as Cost Engineer. The firm is constructing the 120 million dollar Taconite Plate expansion facilities for the Reserve Mining Company at Silver Bay.

Arthur F. Dershowitz, who was previously with the General Electric Company in Waterford, New York, is now located in the Schenectady, New York office of the same company.

Harold B. Ewolt is now Project Manager in the Construction Department of Beacon Construction Company, Oscoda, Michigan. He was the former Director of Planning, South American Operations for Cerro de Pasco Corporation, New York City.

George J. Marlowe has been appointed Director of General Engineering and elected Vice-President of Scientific Design Company, Inc. of New York City. He was the former project Manager in the Engineering Department of this company.

1961 Directory

American Association of Cost Engineers

Foreword

The following pages contain the names, the positions and/or official titles, the professional addresses and the preferred mailing addresses of all the active Members, Associate Members and Student Members as of May 15, 1961.

This membership list is the property of AACE and is not to be used for advertising or soliciting purposes without written permission of the Executive Secretary.

The entries are necessarily brief, but they reflect as accurately as possible the information provided by the members on their 1961 Dues Transmittal Form. The American Association of Cost Engineers cannot be held responsible for errors or irregularities. Every means has been taken to secure accurate information and to prevent errors. The Office of the Executive Secretary will welcome your note on errors, omissions or additions. Any additions to this list will be included in the September issue of the AACE Bulletin.

Note: When only the business address is given this is the preferred mailing address. If two addresses are given the last address, i.e., home address, is the preferred mailing address. When a person is also a member of a Regional Section this is indicated in parenthesis after his listing, i.e., CM — Chicago Midwest; DV — Delaware Valley; GC — Gulf Coast; NY — Metropolitan New York; NE — New England; NF — Niagara Frontier; NO — Northeast Ohio; P — Pittsburgh; SF — San Francisco; SC — Southern California. Unless otherwise indicated, i.e., (Associate), all listings are of the grade: Member. Founding and Charter members are so designated.

- ACKELSBERG, M. ROBERT**, Mgr., New Product Development, Development Dept., W. R. Grace & Co., 225 Allwood Rd., Clifton, N. J. (NY)
- ADKINS, DONALD G.**, Vice-Pres., Construction & Engineering, E. I. Walker, Inc., Contractor, Engineers, Pensacola, Fla. 432 Cumberland Ave., Gulf Breeze, Fla.
- ALES, FELIX M.**, Project Estimator, Estimating & Proposal Dept., Chemical Construction Co., 320 Park Ave., N.Y. 22, N. Y. (NY)
- ALISON, GEORGE B.**, Mgr., Whesoe Engineering Services Ltd., 8-12 Camden High St., London, N.W. 1, England.
- ALLEN, CHARLES D.**, Valuation Technician, Gas Engineering Dept., Columbia Gas System Service Corp., 1600 Dublin Rd., Columbus 12, Ohio, 258 Brevoort Rd., Columbus 14, Ohio.
- ALLEN, DUNCAN G.**, Owner, Allied Appraisal Co., 5901 Beechnut St., Houston 36, Tex. (GC)
- ALLEN, LAWRENCE C.**, Estimator, Civil Dept., Alonzo B. Reed, Inc., 141 Milk St., Boston 9, Mass. (NE)
- ANDERSON, GUS A.**, 110 Poplar St., Berkeley 8, Calif. (SF)
- ANDERSON, MATTHEW A.**, Supervisor, Construction Costs, Construction Dept., Northern States Power Co., 15 S. Fifth St., Minneapolis 2, Minn.
- ANDREW, LLOYD B. JR.** (Charter), Head, Economic Evaluation, Research & Development Dept., Ethyl Corp., Box 341, Baton Rouge, La.
- APOLANT, RUSSELL W.**, Asst. Sec'y., Contract Dept., The Lummus Co., 385 Madison Ave., N.Y. 17, N.Y. (NY)
- ARMBRUSTER, E.**, Gen. Supt., Brown & Root Ltd., 5460 Patricia Ave., Montreal 29, P.Q., Canada.
- ARMSTRONG, JOHN C.** (Charter), Treas., George S. Armstrong & Co., Inc., 551 Fifth Ave., N.Y. 17, N.Y.
- ARMSTRONG, RALPH W.**, Asst., Supervisor, Cost & Closing, Engineering Dept., E.I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. 91 University Ave., Wilmington Manor Gardens, New Castle, Del. (DV)
- ARMSTRONG, THOMAS T.**, Chief Estimator, Estimating Dept., The Power Gas Corp. Ltd., Box 21, Stockton-on-Tees, Durham, England. 11 Clifton Ave., Eaclescliffe, Durham, England.
- ARMSTRONG, WILLIAM A.**, Cost Engineer, Production Engineering Dept., Linde Co., Div. of Union Carbide Corp., P. O. Box 152, Tonawanda, N.Y.
- ARNOLD, RALPH E.**, Mgr., Jobbing Div., Fort Pitt Bridge Works, Box 151, Canonsburg, Pa.
- ARNOLD, THOMAS H. JR.**, Southwestern Editor, Chemical Week & Chemical Engineering, McGraw-Hill Publishing Co., Prudential Bldg., Rm. W-724, Houston 25, Tex. (GC)
- ARROYAVE, EDWARD A.**, Mechanical Engineer, Engineering Dept., Venezuelan Sun Oil, Maracaibo, Venezuela. Residencia Paraiso, Bloque A, Apartamento 271, Avenida 22, Maracaibo, Venezuela.
- ASCROFT-JENNY, HENRI P.**, Estimator-Engineer, Estimating Dept., McKee Head Wrightson Ltd., 16-26 Baltic St., London, E.C. 1, England. 44 Algiers Rd., London, S.E. 13, England.
- ASHLEY, WILLIAM R. JR.**, Supervisor of Estimating, Central Engineering Dept., Atlas Powder Co., Wilmington 99, Del. (DV)
- ASKEY, W. E.**, Partner, The Pace Co., 214 Winkler Drive, Houston, Tex.
- AUBURN, BASIL J.** (Associate), Pres., Auburn & Associates, Inc., 1051 Brinton Rd., Pittsburgh 21, Pa. (P)
- AVONDO, ROBERT C.** (Associate), Treas. & Mgr. of Electrical Engineering Div., Auburn & Associates, Inc., 1051 Brinton Rd., Pittsburgh 21, Pa. (P)
- AYDELOTTE, W. KENNETH**, Field Engineer, Pipeline Dept., Bechtel Corp., 220 Bush St., San Francisco, Calif. (SF)
- AZUD, GEORGE**, Supervisor, Construction Estimating, Engineering Dept., Air Products, Inc., P. O. Box 538, Allentown, Pa. R. D. No. 2, Box 389, Fleetwood, Pa.
- BABB, WAYNE M.**, Estimating Coordinator, Engineering & Construction Dept., The Atlantic Refining Co., 260 S. Broad St., Philadelphia, Pa. (DV)
- BABCOCK, KENNETH E.**, Project Coordinator, Central Engineering Dept., Diamond Alkali Co., Box 430, Painesville, Ohio. 153 Doan Ave. N., Painesville, Ohio.
- BACH, NORMAN G.** (Founder), Sr. Estimator, Engineering Dept., Monsanto Chemical Co., P. O. Box 1311, Texas City, Tex. (GC)
- BACHMAN, HANS**, Engineer, Engineering Dept., CIBA Aktiengesellschaft, Basel, Switzerland.
- BAILEY, PHILIP H.** (Charter), Consultant, Engineering Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. R. D. No. 1, River Rd., New Castle, Del. (DV)
- BAIRD, JAMES L.** (Founder), Vice-Pres., Chemical Engineering & Estimating Dept., Artisan Metal Products Inc., 73 Pond St., Waltham 54, Mass. (NE)
- BAKER, LAWRENCE D.**, Estimator, Sales Dept., Michel & Pfeiffer Iron Works, 212 Shaw Rd., S. San Francisco, Calif. (SF)
- BAKER, WARREN J. JR.**, Mgr., Technical Dept., Insurance Co. of North America, 1600 Arch St., Philadelphia 1, Pa. (DV)
- BALDINELLI, EDWARD L.**, Project Estimator, Estimating Dept., Kaiser Engineers, Kaiser Ctr., 300 Lakeside Drive, Oakland 12, Calif. (SF)
- BALLENGER, JAMES M.** (Founder), Engineer, Refining Coordination Dept., Standard Oil (N.J.), 30 Rockefeller Plaza, N.Y. 20, N.Y. R.F.D. No. 1, Long Hill Rd., Millington, N.J. (NY)
- BALMER, HARRY A.**, Chief Contract Adjustment Engineer, Contract Administration Dept., Uhl, Hall & Rich, P.O. Box 327, Niagara Falls, N.Y. (NE)
- BALOTTI, RICHARD R.**, Supervisor, Engineering Dept., E.I. du Pont de Nemours & Co., Inc., Louviers Bldg., Wilmington 98, Del. (DV)
- BARBER, HASTINGS A.**, Supervisor of Estimates, Engineering Dept., Oliver Iron Mining Div., U.S. Steel Corp., 912 Wolvin Bldg., Duluth, 2, Minn.
- BARDELLA, ACHILLES H.** (Charter), Sr. Estimator, Estimating Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia, Pa. 217 Country Rd., Berwyn, Pa. (DV)
- BARKER, RALPH E.**, Engineer-Estimating, Engineering Dept., Continental Oil Co., 1000 S. Pine St., Ponca City, Okla.
- BARKER, ROBERT W.**, Cost Engineer, Cost Engineering Dept., The Ralph M. Parsons Co., 617 W. Seventh St., Los Angeles, Calif.
- BARLOW, FRANK J.**, Pres., AZCO Inc., P. O. Box 228, Highway 41, Appleton, Wis.
- BARNES, FREDERICK H.**, Chief Engineer-Control, Engineering Dept., U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa. 235 Woodhaven Drive, Pittsburgh 28, Pa. (P)
- BARON, PAUL J.**, Administrative Asst., Engineering Dept., Niagara Mohawk Power Corp., 535 Washington St., Buffalo 3, N. Y.
- BARRY, JOHN E.**, Cost Engineer, Engineering Dept., E. I. du Pont de Nemours & Co., Inc., Rm. 40 N 7, Louviers Bldg., Wilmington 98, Del. (DV)
- BARTHELSON, NORMAN A.** (Founder), Project Leader, Process Engineering Sect., Chemical Engineering Dept., Atlas Powder Co., Wilmington 99, Del.
- BASSETT, FRANKLIN A.** (Charter), Construction Engineer, Construction Dept., The Lummus Co., 146 Haynes Ave., Newark, N. J., 7058 Dogwood Lane, Mentor, Ohio.
- BATES, ALAN G.**, Mgr., Economic Evaluation Sect., Development Appraisal Dept., Atlas Powder Co., Wilmington 99, Del. (DV)
- BATHIANY, ROBERT C.** (Charter), Assoc. Director, Research Div., Weyerhaeuser Timber Co., Longview, Wash. 1208 24th Ave., Longview, Wash.
- BATTERSBY, MARK W.**, Professional Engineer —Self-employed, 13762 Northwood Rd., N.W., Seattle 77, Wash.
- BAUMAN, H. CARL**, Mgr., Cost Engineering Dept., Engineering & Construction Div., American Cyanamid Co., 30 Rockefeller Plaza, N. Y. 20, N.Y.
- BAXTER, DONALD N.** (Charter), Chief Estimator, Development Dept., Allied Chemical Corp., Nitrogen Div., P. O. Box 61, Hopewell, Va.
- BECK, FRANKLIN G.**, Project Estimator, Estimating Dept., Blaw-Knox Co., Chemical Plants Div., 300 Sixth Ave., Pittsburgh 22, Pa. 19 Windsor Place, Bethel Park, Pa. (P)
- BECKER, JOSEPH, JR.**, Contract Mgr., Engineering & Construction Div., Koppers Co., Inc., 302 Chamber of Commerce Bldg., Pittsburgh 19, Pa. (P)
- BEHAN, RICHARD J.** (Charter), Installation & Construction Engineer, Central Engineering Dept., Merck & Co. Inc., 127 Lincoln Ave., Rahway, N. J.
- BEHRENS, JOHN R.** (Founder), Design & Drafting Sect. Head, Engineering Design & Development Dept., Merck & Co. Inc., 127 Lincoln Ave., Rahway, N. J. (NY)
- BELLE, GIANCARLO**, Estimator, Estimating Dept., Dufrene Engineering Co. Ltd., 1832 Blvd. Pie IX, Montreal, P. Q., Canada.
- BENFORD, HARRY B.** (Charter) Prof. of Naval Arch. & Marine Engineering, Univ. of Mich., Ann Arbor, Mich.
- BENNETTS, J. LAWRY, Sr.**, Economic Analyst, Controller's Dept., Food Machinery & Chemical Corp., 161 E. 42nd St., N. Y. 17, N. Y. 22 Severance Drive, Stamford, Conn.

- BENSON, HOMER E.**, Research Engineer, Research & Development Dept., Consolidated Natural Gas System Co., Two Gateway Ctr., Pittsburgh 22, Pa. (P)
- BERK, JONAS M.**, Partner, Industrial Appraisal Engineers, 4189 Bellaire Blvd., Houston 25, Tex. (GC)
- BERNAY, JOHN A.**, Estimator, Central Engineering Dept., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland, Ohio. 7614 Acacia Rd., Mentor, Ohio. (NO)
- BERNHARDT, LOWELL**, Supervisor, Cost Engineering, Engineering & Research Staff, Ford Motor Co., Box 2053, Dearborn, Mich. 14800 Southfield Rd., Detroit 23, Mich. (P)
- BIENEMANN, CHARLES E.**, Executive Asst., Alexander & Alexander, Inc., 2225 N. Charles St., Baltimore 18, Md. Ridewood, Md.
- BIERMAN, CLIFFORD D. H.**, Chief Estimator, Chemical Plants Div., Blaw-Knox Co., 300 Sixth Ave., Pittsburgh 22, Pa. (P)
- BINGEMANN, ARTHUR L.**, Estimating Supervisor, Planning & Estimating Dept., American Viscose Corp., Walnut & Pine Streets, Marcus Hook, Pa.
- BIRCHARD, RALPH**, Chief, Construction Dept., Rader & Associates, 100 S. Biscayne Blvd., Miami 32, Fla. 107 S. E. 7th St., Miami 32, Fla.
- BLACK, DR. JAMES H.**, Founder, Head, Economics, Coal, Coke & Chemicals Div., Applied Research Lab., U. S. Steel Corp., Monroeville, Pa. (P)
- BLACKWELDER, CHARLES R., JR.**, Construction Cost Engineer, Estimating Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia, Pa. 1110 Webster Drive, Wilmington 3, Del.
- BLACKWOOD, FRANK A.**, Asst. Director, Finance & Administration, Scientific Design Co., 2 Park Ave., N. Y. 16, N. Y. (NY)
- BLAHA, WALTER J.**, Engineering Control Supervisor, Engineering Dept., Pittsburgh Chemical Co., Div. Pittsburgh Coke & Chemical Co., Neville Island, Pittsburgh 25, Pa. (P)
- BLAZIER, JOHN E., SR.**, Engineer, Refining Coordination Div., Standard-Vacuum Oil Co., 1000 Westchester Ave., White Plains, N. Y.
- BLEW, ANDY S.** (Associate), Estimator, Construction & Engineering Dept., Linde Co., Div. of Union Carbide Corp., P. O. Box 152, Tona-wanda, N. Y. (NF)
- BOECKH, EVERARD H.**, Proprietor, E. H. Boeckh & Associates, Consulting Engineers, 1406 M St., N.W., Washington 5, D. C.
- BOLL, STEPHEN H.** (Associate), Dept. Head, Cost Estimating, Consumer Products, Motorola, Inc., 9401 W. Grand Ave., Franklin Pk., Ill. 508 S. Pine St., Mt. Prospect, Ill. (CM)
- BOND, W. W.**, Head Engineer, General Engineering Dept., American Oil Co., 2400 New York Ave., Whiting, Ind.
- BONNET, WILLIAM E.**, Mgr., Economics & Planning, Research & Engineering Dept., Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.
- BONNETT, RICHARD L.**, Project Leader, Research Engineering Dept., The Rath Packing Co., Sycamore & Elm, Waterloo, Iowa.
- BOOTH, CHARLES F.**, Assoc. Director, Research & Development Dept., Virginia-Carolina Chemical Corp., 401 E. Main St., Richmond 7, Va. 2607 Park Ave., Apt. 1, Richmond 20, Va.
- BOSSLER, THOMAS H.**, Assoc. Technologist, Research & Development Dept., Applied Research Lab., U.S.S. Research Ctr., U. S. Steel Corp., Monroeville, Pa. 611 Chinaberry Rd., Monroeville, Pa. (P)
- BOSTON, G. WILLIAM**, Head, Estimating Sect., Engineering Dept., Girdler Corp., P. O. Box 174, Louisville 1, Ky.
- BOUDREAU, HECTOR J. H.**, Cost Analyst, Engineering Dept., The Shawinigan Engineering Co. Ltd., 625 Belmont St., Montreal, P. Q., Canada.
- BOURBEAU, JOSEPH**, Cost Engineer, Power Development Div., Hydro-Quebec, 107 Craig St. W., Montreal, P. Q., Canada.
- BOWKER, JOHN E.**, Sr. Engineer, Central Technical Dept., Bethlehem Steel Co., Ship-building Div., Quincy 69, Mass. 16 Reservoir Rd., Cohasset, Mass.
- BOYD, JAMES H.** (Charter), Consulting Chemical Engineer, self-employed, 250 Park Ave., N. Y. 17, N. Y. (NY)
- BOYD, NORMAN G.**, Asst. Mgr., Estimating Branch, The British Petroleum Co. Ltd., BP House, Ropemaker St., London, E. C. 2, England.
- BRANNEN, FRANCIS M.**, Mechanical Engineer, Engineering Dept., Southern Nitrogen Co. Inc., P. O. Box 246, Savannah, Ga.
- BRAUN, PETER**, Sr. Estimator & Sales Engineer, Industrial Sales Dept., Canadian Vickers Ltd., 4970 Notre Dame St. E., Montreal, P. Q., Canada.
- BRIDGEMAN, JOHN R.**, Asst. Cost Engineer, Electric Engineering Dept., Public Service Electric & Gas Co., 80 Park Place, Newark 1, N. J. (NY)
- BRIDIER, RAYMOND S.** (Charter), Mgr., Estimating & Construction, Southwest Area, The Lummus Co., P. O. Box 22105, Highland Village Station, Houston 27, Tex. 823 Japuet Drive, Bellaire, 101, Tex.
- BRICHT, JAMES O.**, Sr. Engineer, Organic Engineering Dept., Monsanto Chemical Co., 1700 S. 2nd St., St. Louis 77, Mo. 921 Leonard Drive, Rock Hill 19, Mo.
- BRINK, DANIEL T.**, Chief Estimator, Central Engineering Dept., Corn Products Co., 201 N. Wells, Rm. 1020, Chicago 6, Ill. (CM)
- BROMBERG, IRWIN**, Mgr., of Cost Control Dept., Foster Wheeler Corp., 666 Fifth Ave., N. Y. 19, N. Y. 61-14 215th St., Bayside 64, N. Y. (NY)
- BROOKS, WILLIAM T.**, International Minerals & Chemicals Corp., Old Orchard Rd., Skokie, Ill. 100 Montgomery Lane, Glenview, Ill. (CM)
- BROOKSHIER, RALPH A.**, Estimator, Estimating Dept., The H. K. Ferguson Co., 1783 E. 11th St., Cleveland, Ohio. 3466 Warren Rd., Cleveland 11, Ohio (GC)
- BROOMALL, ELMER L.**, Cost Engineer, Engineering Economics Dept., Sun Oil Co., 1616 Walnut St., Philadelphia 3, Pa. (DV)
- BROSH, RAPHAEL A.**, Costing Engineer, The Laboratories, Israel Mining Industries Ltd., P. O. B. 5249, Haifa, Israel.
- BROSAN, DONALD F.** (Charter), Sr. Estimating Engineer, Estimating Dept., Bechtel Corp., 485 Lexington Ave., N. Y. 17, N. Y. (NY)
- BROWER, WALTER C., JR.** (Associate), Cost Engineer, Cost Engineering Dept., American Cyanamid Co., 30 Rockefeller Ctr., N. Y. 20, N. Y. 422 Hunter St., Mamaroneck, N. Y. (NY)
- BROWN, CARL, JR.** (Associate), Estimator, Engineering Dept., Olin Mathieson Chemical Corp., Box 547, Brandenburg, Ky.
- BROWN, CARL L.** (Associate), Estimator, Contracts & Proposals Dept., Rocketdyne Div., N.A.A. Inc., 6633 Canoga Ave., Canoga Park, Calif.
- BROWN, EDWARD G.** (Founder), Technical Mgr., Plastics Div., Canadian Industries Ltd., P. O. Box 10, Montreal, P. Q., Canada.
- BROWN, JOSEPH G.**, Process Engineer, Process Engineering Dept., Climax Molybdenum Co., 1270 Ave. of the Americas, N. Y. 20, N. Y. (NY)
- BROYLES, LUTHER J.**, Cost Engineer, Administration Dept., Ford Motor Co., P. O. Box 2053, Dearborn, Mich. 9097 Riverdale, Detroit 39, Mich.
- BRUMMERSTEDT, EGON F.** (Founder), Supervising Estimator, Refinery & Chemical Div., Bechtel Corp., 62 First St., San Francisco 4, Calif. (SF)
- BRUSENBACH, RICHARD W.**, Chief Engineer, Engineering Dept., White Pine Copper Co., White Pine, Mich.
- BUCKINGHAM, LESLIE M., JR.**, Partner, Leslie M. Buckingham, Jr. Co., 77 Summer St., Boston 10, Mass. (NE)
- BUELL, WARREN H.** (Charter), Mgr., Economics & Planning, Union Oil Co. of Calif., P. O. Box 7600, Los Angeles 54, Calif. (SC)
- BULMAN, JOHN P.**, Construction Dept., Kellogg International Corp., 7-10 Chandos St., London, W. 1, England. 4 Denbigh Close, London, W. 11, England.
- BURKE, EDMUND M.**, Assoc. Project Engineer, Highway Dept., Macabee, Campbell & Associates, 173 W. Madison St., Chicago 2, Ill. 4824 Oak Ctr. Drive, Oaklawn, Ill. (CM)
- BURRELL, DOUGLAS L.** (Charter), Sr. Project Engineer, Engineering Dept., U. S. Industrial Chemicals Co., Div. of National Distillers & Chemical Corp., Tuscola, Ill. 503 E. Pinzon St., Tuscola, Ill. (CM)
- BURRESS, GILBERT E.**, Cost Engineer, Engineering Dept., Paul Hardeman, Inc., 10579 Dale Ave., Stanton, Calif.
- BURROWS, EDWARD J.**, Asst. Sr. Valuation Engineer, Gas Engineering Dept., Valuation Section, Columbia Gas System Service Corp., 1600 Dublin Rd., Columbus 12, Ohio.
- BUSCH, JOSEPH S.**, Sect. Head, Core Analysis & Test Sect., Fuel & Materials Div., Atomic Power Development Associates, Inc., 1911 First St., Detroit 26, Mich.
- BUTLER, JAMES J., JR.**, Sr. Process Engineer, Research & Development Dept., Jones & Laughlin Steel Corp., 900 Agnew Rd., Pittsburgh 30, Pa. (P)
- BUXTON, IRL H.**, Staff Estimator, Estimates Dept., AETRON, A. Div. of Aerojet-General Corp., 410 N. Citrus Ave., Covina, Calif.
- CALER, EMERY E.**, Sect. Leader, Engineering, Shell Chemical Div., Shell Oil Co., 50 W. 50th St., N. Y. 20, N. Y. (NY)
- CALLAHAN, MATTHEW F.**, Sales Engineer, Plastics & Resin Dept., Allied Chemical Co., 40 Rector St., N. Y. N. Y. 72 Elmsford Rd., Bridgeport, Conn. (NY)
- CAMPBELL, COLIN**, Real Estate Appraiser, Self-employed, 617 Harold St., Houston 6, Tex. (GC)
- CAMPBELL, DOUGLAS W., SR.**, Estimator, Estimating Dept., Bechtel Corp., 62 First St., San Francisco, Calif. 5971 La Jolla Cordina Drive, La Jolla, Calif.
- CAMPBELL, EDWARD J.**, Mgr., Industrial Engineering, Mfg. Engineering Dept., Whirlpool Corp., St. Joseph Div., St. Joseph, Mich. (CM)
- CAMPBELL, FRANK J.**, Div. Estimator, Estimates Dept., AETRON, Div. of Aerojet-General Corp., 410 N. Citrus Ave., Covina, Calif., 1339 S. Leland Ave., W. Covina, Calif. (SC)
- CANNERY, CHARLES F.**, Maintenance Engineer, Operations Dept., Koppers Co., Inc., Tar Products Div., Room 1228 Koppers Bldg., Pittsburgh 19, Pa. 3207 Arapahoe Rd., Pittsburgh 34, Pa. (P)
- CANTRELL, RICHARD W.**, Cost Engineer, Wm. Horstmeier Co., 23 Mars St., San Francisco 14, Calif. (SF)
- CARAMEROS, GEORGE D., JR.** (Founder), Mgr., New Developments Dept., El Paso Natural Gas Products Co., P. O. Box 1161, El Paso, Tex.
- CARBREY, WILLIAM L.**, Project Engineer—Analyst, Furnace Carbon Dept., Columbian Carbon Co., P. O. Drawer 1562, Monroe, La.
- CARLSON, WARREN O.**, 4608-29th Ave., S. W., Calgary, Alberta, Canada
- CARNICIE, DOUGLAS R.**, Estimator, Project Evaluation Dept., Scientific Design Co., 2 Park Ave., N. Y. 16, N. Y. 31 Nutty Place, Staten Island 10, N. Y. (NY)
- CARNEY, SHELDON G.**, Supervisor, Estimating & Cost Sect., Standards Dept., Dow Chemical Co., 256 Bldg., Midland, Mich., 1106 Rodd St., Midland, Mich.
- CARROLL, ALF L.**, Foreign Service Officer, International Cooperation Administration, USOM/K-RD-PD, APO 301, San Francisco, Calif.
- CARUTHERS, EDWARD G.**, Estimator, Engineering Dept., Rohm & Haas Co., P. O. Box 219, Bristol, Pa. (DV)
- CASTLE, RONALD E.**, Chemical Engineer, Pesticides Research, Olin Mathieson Chemical Corp., P. O. Box 297, Port Jefferson Station, L. I., N. Y., Harbor Beach Rd., Miller Place, L. I., N. Y.
- CATES, PAUL E.** (Charter), Engineer-Estimator, Engineering Dept., Fischbach & Moore, Engineering & Electrical contractor, 7408 Old Main St. Rd., Houston 5, Tex. 551 S. 3rd St., Bellaire 101, Tex. (GC)
- CAUFIELD, JAMES J.** (Founder), Mfg. Research Specialist, Major Appliance Div., General Electric Co., Building 1, Appliance Pk., Louisville 1, Ky.
- CENTER, C. EUGENE**, Asst. to Mgr., Administration Services, Engineering Support, Bettis Atomic Power Laboratory, Westinghouse Electric Corp., P. O. Box 1468, Pittsburgh 30, Pa. (P)
- CHAPMAN, HERMAN A.**, Supervisor of Estimating, Engineering & Construction Dept., Estimating Sect., The Atlantic Refining Co., 260 S. Broad St., Philadelphia 1, Pa. (DV)
- CHARLES, THOMAS** (Founder), Director of Purchases, Purchasing Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia 2, Pa.
- CHARLTON, JOHN B.**, Supervising Engineer, Engineering & Development Dept., Chemstrand Corp., Decatur, Ala.
- CHATFIELD, CHARLES F.**, Mgr., Estimating Div., Administrative Engineering Dept., The M. W. Kellogg Co., 711 Third Ave., N. Y. 17, N. Y. (NY)
- CHENEY, DONALD S.**, Sr. Civil Engineer, Dwelline Operations, Federal Elec. Corp., Paramus Industrial Pk., Paramus, N. J. P. O. Box 1452, Stamford, Conn. (NY)
- CHENG, KENNETH W. P.**, Estimator, Estimating Dept., Walter Kidde Constructors, Inc., 19 Rector St., N. Y. N. Y. 324 W. 96th St., N. Y. 25, N. Y.
- CHESLOW, RICHARD T.**, Development Engineer, Gen. Development Dept., Hooker Chemical Corp., Buffalo Ave., Niagara Falls, N. Y. (NF)
- CHESTER, JOHN M.**, Cost Engineer, Cost Analysis Dept., The RAND Corp., 1700 Main St., Santa Monica, Calif. 708 Hampden Place, Pacific Palisades, Calif. (SC)
- CHILDRESS, HERMAN L.**, Asst. to Vice-Pres., The Standard Oil Co. of Calif., 225 Bush St., San Francisco 20, Calif.
- CHILTON, CECIL H.** (Founder), Editor, Chemical Engineering, McGraw-Hill Publishing Co., 330 W. 42nd St., N. Y. 36, N. Y., 150 Davison Ave., Oceanside, N. Y. (NY)
- CHIRTEL, JOSEPH S.** (Charter), Supt., Organic Plant, Victor Chemical Works, Div. of Stauffer Chemical Co., P. O. Box 472, Mt. Pleasant, Tenn.
- CHISHOLM, DANIEL**, Head, Project Engineering Sect., Engineering Dept., Texas Butadiene & Chemical Corp., P. O. Box 777, Channelview, Tex. (GC)
- CHRISTGAU, ARTHUR H.**, Mfg. Services Engineer, Mfg. Services Dept., West Virginia Pulp & Paper Co., 230 Park Ave., N. Y. 17, N. Y. (NY)

- CISKE, VERNON A., Chief Estimator, Estimating Dept., John F. Meissner Engineers, Inc., 300 W. Washington Blvd., Chicago 6, Ill. (CM)
- CLARK, EARL K., Founder, Chief Estimator, Engineering & Construction Services Div., The Dow Chemical Co., 3636 Richmond Ave., Houston, Tex. Box 722, Lake Jackson, Tex. (GC)
- CLARK, RALPH W., Sr. Project Engineer, Engineering Dept., U. S. Industrial Chemicals Co., Div. of National Distillers & Chemical Corp., 99 Park Ave., N. Y. 16, N.Y., 174 Foxwood Rd., W. Nyack, N.Y. (NY)
- CLARK, WILLIAM G. (Founder), Div. Estimator, Engineering Dept., The Dow Chemical Co., Western Div., P. O. Box 351, Pittsburg, Calif. (SF)
- CLASSEN, KENNETH G., Olefins Works Administration, Union Carbide Olefins Co., Div. of Union Carbide Corp., P. O. Box 8004, S. Charleston 3, W. Va.
- CLAYTON, CARL C. (Founder), Cost Estimator, Research & Development Dept., Pittsburgh Plate Glass Co., P. O. Box 4026, Corpus Christi, Tex.
- CLINEHENS, J. W., Sr. Estimator, Estimating Dept., General Electric Co., Richland, Wash. 1015 Elm Ave., Richland, Wash.
- COFFEY, LOUIS J., Coordinator of Estimating Data, Engineering Dept., Standard Oil Co. of Calif., Room 425, 225 Bush St., San Francisco 20, Calif. (SF)
- COGHLAN, CHARLES A. (Founder), Sr. Technologist, Research & Technical Dept., Texaco Inc., Beacon Laboratories, Beacon, N. Y.
- COHEN, AARON J. (Charter), Consulting Engineer, 3607 S. Braeswood Blvd., Houston 25, Tex. (GC)
- COLUCCI, ONORIO, Project Mgr., Industrial Chemicals Div., Pittsburgh Chemical Co., 2028 Grant Bldg., Pittsburgh 19, Pa. 1318 Cardinal Dr., Pittsburgh 16, Pa. (P)
- CONDON, JOHN A., Partner, John A. Condon & Associates, Construction Consultants, 689 N.W. 45th St., Miami 37, Fla.
- CONNELL, JOSEPH T., Asst. to Engineering Mgr., Engineering Works Div., Dravo Corp., Neville Island, Pittsburgh 25, Pa. (P)
- CONSORTI, THOMAS P., Pres., Contractural Dept., Veteran Pipe Covering Co., Inc., 313 E. 6th St., N. Y. 3, N.Y.
- COOK, LEE H., Vice Pres. & Chief Estimator, John B. Orr, Inc., 485 N.W. 54th St., Miami 37, Fla. 5767 S. W. 39th St., Miami 55, Fla.
- COOKE, EDWARD F. (Associate), Sr. Estimator, Estimating Dept., Catalytic Construction Co., P. O. Box A'-Warren Air Force Base, Cheyenne, Wyo.
- COOPER, IRVING H. (Founder), Research Cost Engineer, Chemical Research Div., Garfield Research Laboratories, Heyden Newport Chemical Corp., P. O. Box 7, Garfield, N. J. 834 Palmer Ave., Maywood, N.J. (NY)
- COURTNEY, BRIAN F. (Associate), Engineer, Engineering Research Dept., General Foods Research Ctr., General Foods Corp., 555 S. Broadway, Tarrytown, N. Y.
- COWAN, JAMES C. (Charter), Cost Estimator, Development Dept., Pittsburgh Plate Glass Co., Columbia Chemical Div., P. O. Box 31, Barberton, Ohio. (NO)
- COWELL, W. A., Supervisory Construction Analyst, Loan Guaranty Dept., Veterans Administration, 2320 LaBranch St., Houston, Tex. (GC)
- CRAIG, WALTER S., Engineering Estimator, Production-Engineering Dept., Philadelphia Gas Works, Div. of U. G. I. Co., 1401 Arch St., Philadelphia, Pa. (DV)
- CRAN, JOHN E., Research & Development Dept., Distillers Co., Ltd., "Great Burch", Epsom, Surrey, England 28 Dulwich Wood Ave., London, S. E. 19, England.
- CROCHERON, EDMOND D., Chief-Cost Control, Construction Dept., United Engineers & Constructors, Inc., 1401 Arch St., Philadelphia 5, Pa. (DV)
- CROSS, RAYMOND, Co. Engineer, Engineering Dept., Arnold, Hoffman & Co., Inc., Main St., Dighton, Mass. (NE)
- CUCCI, A. JOSEPH, Estimator, Engineering Dept., Anaconda-Jurden Assoc. Inc., 26 Broadway, N. Y., N. Y. 25 Duncan Lane, Halesite, L. I. N. Y.
- CULBERTSON, RONALD D., SR., Supervisor, Valuation Sect., Rate Dept., The Ohio Fuel Gas Co., 99 N. Front St., Columbus 15, Ohio.
- CULL, JAY A., Chemical Engineer, Research Dept., Hooker Chemical Corp. 47th & Buffalo Ave., Niagara Falls, N. Y. (NF)
- CURTIS, BEN L. (Associate), Cost Engineer, Cost Dept., Stearns-Roger Mfg. Co., 660 Bannock St., Denver 17, Colo.
- CUSTER, A. G., Admin. Asst. to Plant Engineer, Engineering Dept., Celanese Corp. of America, P. O. Box 428, Bishop, Tex.
- CUSTER, ROBERT N., Sr. Div. Mgr., Study & Planning Group, Research Engineering Dept., Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa. (DV)
- DAKE, WILLIS E., Appraisal Design Engineer, Central Engineering Dept., International Minerals & Chemical Corp., 5401 Old Orchard Rd., Skokie, Ill. 1624 Sunset Ridge Rd. Glenview, Ill. (CM)
- DAKIN, JOHN K. (Associate), Construction Cost Analyst, Central Engineering Dept., Ontario Paper Co., Ltd., Thorold, Ontario, Canada. (NF)
- DALCO, JOHN L., Engineer & Sr. Estimator, Estimating & Costs Dept., Stone & Webster Engineering Corp., 49 Federal St., Boston 7, Mass. 82 Cheever St., Milton 87, Mass. (NE)
- DALLAVIA, LOUIS, Mgr., The Dallavia Co., Cost Estimating Standards Consultants, Rt. 4, Box 521-D, Duluth 3, Minn.
- DANZKER, LEO, Principal Process Engineer, Engineering Dept., Western-Knapp Engineering Co., 205 W. Monroe St., Chicago 6, Ill. 66 Birch St., Park Forest, Ill.
- DARROW, JAMES G. (Associate), Owner, Darrow Electric Co., 222 7th St., San Francisco 3, Calif. 744 Monterey Blvd., San Francisco 12, Calif. (SF)
- DAVAGIAN, JOHN S., Vice-Pres. & Chief Engineer, Estimating & Cost Dept., J. F. White Contracting Co., P. O. Box 358, Westwood, Mass. 15 Lantern Rd., Belmont, Mass. (NE)
- DAVIS, J. W. (Charter), Engineer, Universal Oil Products Co., 30 E. Algonquin Rd., Des Plaines, Ill.
- DAVIS, WILLIAM L., JR., Sr. Technologist, Applied Research Lab., U. S. Steel Corp., U. S. S. Research Ctr., Monroeville, Pa. (P)
- DAWE, HAROLD F., Contracts Engineer, Oil & Gas Dept., The Stearns-Roger Mfg. Co., P. O. Box 5888, Denver 17, Colo.
- DAWSON, FRANCIS J. (Charter), Sr. Estimator, Engineering Dept., Tidewater Oil Co., Delaware City, Del. (DV)
- DEATHERAGE, GEORGE E., Construction Consultant, National Schools of Construction, Satuma, Fla.
- DeLAMATER, HAROLD J., Cost Estimator, Partner, Industrial Estimating Service, 35 Newbury St., Boston, Mass. (NE)
- DENNIE, ROBERT F., Sect. Head-Systems Development, Administrative Engineering, The M. W. Kellogg Co., 711 Third Ave., N. Y. 17, N.Y. (NY)
- DERSHOWITZ, ARTHUR F. (Charter), Chemical Engineer, Industrial Engineering Operation Dept., General Electric Co., Bldg. 23, Rm. 310, 1 River Rd., Schenectady, N.Y. (NY)
- DICKENS, SAMUEL P. (Charter), Director of Commercial Fuels, Process Development, Research & Technical Dept., Texaco Research Ctr., Texaco, Inc., Box 509, Beacon, N. Y.
- DIERDORFF, LEE H., JR., Supervisor, Engineering Liaison, Inorganic Research & Development Dept., Food Machinery & Chemical Corp., P. O. Box 8, Princeton, N. J., 433 Walnut Lane, Princeton, N. J.
- DI GIACINTO, ALBERT D., Vice-Pres., Spencer White & Prentiss, Inc., 10 E. 40 St., N. Y. 16, N. Y. 68 Pilgrim Ave., Yonkers, N. Y. (NY)
- DILLON, CARL E. (Charter), Cost Engineer, Costing & Appraisals Dept., Shell Development Co., Emeryville, Calif. (SF)
- DINNING, THOMAS N. (Charter), Engineering Estimator, Engineering & Construction Services Div., The Dow Chemical Co., The Dow Ctr., Richmond Ave. at Buffalo Speedway, Houston, Tex. (GC)
- DISANTO, BARTEL J., Director of Engineering, Central Engineering Dept., American Smelting & Refining Co., 514 Crandall Bldg., Salt Lake City 1, Utah.
- DISMAN, SOLOMON, Chemical Engineer, Research & Development Administration, Abbott Laboratories, N. Chicago, Ill. 1243 Glencoe Ave., Highland Park, Ill.
- DI VITA, LEO R., Field Engineer, Construction Management Dept., Meissner Engineers, Inc., 300 W. Washington, Chicago 6, Ill., 2228 S. Bell Ave., Chicago 8, Ill. (CM)
- DMYTRYSZYN, MYRON, Engineering Specialist, Organic Engineering, Monsanto Chemical Co., 1700 S. 2nd St., St. Louis 77, Mo.
- DODGE, WESLEY J., Sr. Assoc. Engineer, Engineering Dept., Socony Mobil Oil Co., 150 E. 42nd St., N. Y. 17, N. Y. (NY)
- DONALDSON, WILLIAM G., Emerson-Garden Electric Co., Inc., 485 Lexington Ave., N.Y. 17, N.Y. 461 First St., Oradell, N.J. (NY)
- DONOVAN, WILLIAM J., Sr. Estimating Engineer, Process Plants Div., Foster Wheeler Corp., 666 Fifth Ave., N.Y. 19, N.Y. (NY)
- DOOLITTLE, FREDERICK J., Div. Estimator, Engineering Service & Support Div., AETRON, A Div. of Aerojet-General Corp., 410 N. Citrus Ave., Covina, Calif. 332 N. Encinitas Ave., Monrovia, Calif. (SC)
- DORN, THEODORE M., Cost Analyst, Cost Accounting Dept., Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio. (NO)
- DOW, STEWART, Sr. Estimator/Resident Engineer/Project Mgr., Engineering Dept., Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio. Box 9036, E. Akron Station, Akron 5, Ohio.
- DRISKO, THOMAS E., JR., Research Dept., Dow Chemical Co., P. O. Box 351, Pittsburgh, Calif. 1536 Lucky Dr., Concord, Calif. (SF)
- DUBUSSION, JEAN A., Estimator, Industrial Tire, Canadian Vickers Co., Ltd., P. O. Box 550 Place D'Armes, Montreal, P.Q., Canada.
- DUNDAS, ARTHUR T., Chief Estimator, Engineering Dept., Tidewater Oil Co., Tidewater Oil Co., Delaware City, Del.
- DYBDAL, ERNEST C. (Charter), Sr. Chemical Engineer, Research Dept., Monsanto Chemical Co., Nicholas Rd., Dayton 7, Ohio.
- DYCKMAN, CLOVIS E. (Charter) Polk County, Columbus, N.C. (CM)
- EADY, CHARLES W., Sr. Estimator, Special Projects Office, George Wimpey & Co., Ltd., Floyer House, Great West Rd., Brentford, Middlesex, England.
- EARLY, LOUIS B., Engineer, Cost Analysis Dept., The RAND Corp. 1700 Main St., Santa Monica, Calif. (SC)
- EASON, WALTER E., JR., Mgr., Research Evaluation, New Product Development Dept., Research and Development Div., W. R. Grace & Co., Washington Research Ctr., Clarksville, Md.
- EAVES, ELSIE, Mgr., Business News Dept., Engineering News-Record, McGraw-Hill Pub. Co., Inc., 330 W. 42nd St., N.Y. 36, N.Y. (NY)
- EAZZETTA, DOMINICK A. (Associate), Group Leader, Engineering Services Group, Process Improvement-Engineering Dept., Lederle Laboratories Div. American Cyanamid Co., Middletown Rd., Pearl River, N.Y. (NY)
- EBERHARDT, REINHOLD H., Estimating Supervisor, Estimating & Budget Dept., Engineering & Construction Div., Koppers Co., Inc., 3018 Koppers Bldg., Pittsburgh 19, Pa. 2120 Groveland St., Pittsburgh 34, Pa. (P)
- EBERMAN, J. W., Sr. Engineer, Engineering Dept., Shell Chemical Corp., 50 W. 50th St., N.Y. 20, N.Y. (NY)
- EDELE, FREDERICK F., Estimating Supervisor, Design & Construction Dept., Union Carbide Chemicals Co., P. O. Box 8361, S. Charleston 3, W. Va.
- EGGLESTON, THOMAS H., Chief Estimator, Estimating Dept., AE Div., The Ralph M. Parsons Co., 617 W. 7th St., Los Angeles 17, Calif. (SC)
- EHRET, RUSSEL S. (Charter), Chief Estimator, Project Estimating Dept., C. F. Braun & Co., 1000 S. Fremont Ave., Alhambra, Calif. (SC)
- EISENGREIN, HARRY F., Staff-Mechanical Engineer, Engineering Dept., Republic Steel Corp., 1010 Midland Bldg., Cleveland 1, Ohio (NO)
- ELLIOTT, WILLIAM E. (Associate), Inspector, Bureau of Architecture, City of San Francisco, Rm. 250—City Hall, San Francisco 2, Calif. 94 Lovell Ave., Mill Valley, Calif. (SF)
- ENGELMAN, RICHARD H., Project Engineer, Overseas Engineering Div., Procter & Gamble Co., P.O. Box 201, Cincinnati 24, Ohio.
- ENYEDY, GUSTAV, JR., Process Engineer, Central Engineering Dept., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio. (NO)
- ESTOCK, HENRY G., Chief Estimator, Engineering Dept., National Aniline Div., Allied Chem. Corp., P.O. Box 975, Buffalo 5, N.Y. (NF)
- EVANS, RONALD W., Construction Engineer, Construction Dept., Montreal Engineering Co. Ltd., P. O. Box 250—Place D'Armes, Montreal, P.Q., Canada.
- EWOLDT, HAROLD B., Project Mgr., Construction Dept., Beacon Construction Co., 100 Hanover St., Boston 34, Mass. 5282 Cedar Lake Rd., Oscoda, Mich.
- FABER, JOHN H., Chemical Engineer, Economic and Technical Evaluation Staff, U. S. Bureau of Mines, Box 880, Morgantown, W. Va.
- FALK, GEORGE B., Sr. Research Chemical Engineer, Research Dept., Allied Chemical Corp., General Chemical Div., General Chemical Research Lab., P. O. Box 405, Morristown, N.J.
- FARKAS, HAROLD (Associate), Jr. Engineer, Central Engineering Dept., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio. 2060 E. 83rd St., Cleveland 3, Ohio.
- FARRELL, JOHN J., Sr. Estimator, Estimating Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia 2, Pa. (DV)
- FEFFERMAN, BERNARD (Charter), Estimating Engineer, Estimating Dept., Badger Mfg. Co., 363 Third St., Cambridge, Mass. (NE)
- FEEER, LESLIE L., Sect. Head, Estimating and Planning Sect., Central Engineering Dept., Imperial Chemical Industries of Australia & New Zealand, Ltd., ICI House, 1 Nicholson St., Melbourne, Victoria, Australia.

- FERRETTI, EMMETT J.**, Supervisor, Process Analysis & Evaluation, Development Dept., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.
- FETTERMAN, J. V.**, Administrative Mgr., Defense & Space Div., Air Products, Inc., P. O. Box 538, Allentown, Pa.
- FISCHER, FRED W.**, Budget & Control Engineer, Engineering Dept., Quebec Cartier Mining Co., Port Cartier, Quebec, Canada.
- FISHER, BRUCE R., JR.**, Cost Analysis Supervisor, Control Dept., Naugatuck Chemical Div., U.S. Rubber Co., Naugatuck, Conn. (NY)
- FITHIAN, ROBERT E.** (Charter), Supervisor, Special Reports Group, Engineering Dept., El Paso Natural Gas Co., P.O. Box 1492, El Paso, Tex. (GC)
- FLOOD, H. W.**, Staff Member, Process Metallurgy Group, Arthur D. Little, Inc., 35 Acorn Pk., Cambridge 40, Mass. (NE)
- FONNER, WILLARD G.**, Cost Engineer, Cost Control Dept., United Engineers & Constructors, Inc., P.O. Box 725, Monroe, Mich.
- FORD, LESLIE J. P.**, Sales & Estimating Dept., Procon (Great Britain) Ltd., Bush House, Aldwych, London, W. C. 2, England, 7 Downfield, Worcester Pk., Surrey, England.
- FORTENBAUGH, CHARLES E.**, Cost Engineer, Central Engineering Dept., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland, Ohio, 1454 Hopkins Rd., Mentor, Ohio.
- FOURNIER, WILLIAM A.**, Cost & Office Engineer, Engineering No. 156, U.S. Gypsum Co., 300 W. Adams St., Chicago 6, Ill.
- FOUSHI, JOHN A., JR.**, Engineer, Project & Control Group, Engineering Dept., Inland Steel Co., 3210 Watling St., E. Chicago, Ind. 839 Campbell Ave., Chicago Heights, Ill. (CM)
- FOX, ROBERT S.**, Estimator-Engineer, Estimating Dept., Potomac Metal Products Div. of Cochrane Corp., P. O. Box 269, Pottstown, Pa. (DV)
- FRANCHI, JOSEPH R.**, Sr. Cost Engineer, Cost Accounting Dept., Ford Motor Co., 20000 Rotunda Dr., Dearborn, Mich. 1217 Falcon Rd., Dearborn, Mich.
- FRANK, JOHN G.**, Staff Engineer, Engineering Dept., Mich. Consolidated Gas Co., 415 Clifford St., Detroit 23, Mich.
- FRANKS, FREDERICK A.** (Founder), Supervisor, Planning & Estimating Sect., Central Engineering Dept., American Viscose Corp., Walnut & Pine Sts., Marcus Hook, Pa. (DV)
- FREEDBERG, ARTHUR L.** (Associate), Economic Analyst, Development Dept., W. R. Grace & Co., Polymer Div., 225 Allwood Rd., Clifton, N. J.
- FRIESE, FRED H.**, Superintendent Process Engineering, Process Engineering Dept., Canadian Chemical Co., P. O. Box 99, Edmonton, Alberta, Canada.
- FRITZ, ALPHONSE W.**, Chief Estimator, Engineering Dept., Inorganic Chemicals Div., Monsanto Chemical Co., 800 N. Lindbergh Blvd., St. Louis 66, Mo.
- FROELICH, LEONHARD H.**, Div. Head, Chemical Engineering & Engineering Analysis, Engineering Research Dept., Swift & Co., U. S. Yards, Chicago 9, Ill. 5200 S. Blackstone, Chicago 15, Ill. (CM)
- FROELICH, ZEEV.** Site Engineer & Estimator, Engineering Dept., Fertilizers & Chemicals Ltd., P. O. Box 1428, Haifa, Israel 43 Hageffen St., Haifa, Israel.
- FROST, FRANK L., JR.** (Founder), Sr. Research Scientist, Industrial & Biochemical Dept., E. I. du Pont de Nemours & Co., Inc., Experimental Station, Wilmington, Del. (DV)
- FUCHS, WARREN.** Vice-Pres., Engineering Dept., Industries Development Corp., P. O. Box 6144, Haifa, Israel.
- FULLER, ROBERT H.** (Charter), Chief Estimator The Lummus Co., P. O. Box 22105-Highland Village Station, Houston 27, Tex.
- FULTON, ROBERT A., JR.**, Sr. Estimator, Pricing & Estimating Dept., Atomics International, P. O. Box 309, Canoga Park, Calif. 20521 Dumont St., Woodland Hills, Calif. (SC)
- FUNK, WILLIAM J.**, Mgr., of Foreign Products, Refinery & Chemical Div., Arthur G. McKee & Co., 2300 Chester Ave., Cleveland 1, Ohio. (NO)
- GAETO, ANTHONY J.**, Chief Estimator, Estimating Dept., Potomac Metal Products Works, Cochrane Div., Crane Co., P. O. Box 269, Pottstown, Pa. (DV)
- GAFFNEY, DR. BERNARD J.**, Director of Engineering, Central Engineering Dept., Wood Conversion Co., First National Bank Bldg., St. Paul 1, Minn.
- GAGE, WALTER H., JR.**, Sr. Estimator, Estimating Dept. C. F. Braun & Co., 1000 S. Fremont St., Alhambra, Calif.
- GARFINKEL, MICHAEL** (Associate), Asst. Technologist, Engineering Research Dept., General Foods Corp., 555 S. Broadway, Tarrytown, N. Y.
- GATES, MARVIN.** Chief Engineer, Macari Bros. Construction Co., 85 Pierson Lane, Windsor, Conn.
- GATTINELLA, JOSEPH W.**, Cost Control Engineer, Cost Control Dept., United Engineers & Constructors, 1401 Arch St., Philadelphia, Pa. 36 Colonial Pk. Drive, Springfield, Pa. (DV)
- GAUDLITZ, ROBERT T.**, Development Engineer, Engineering Research Dept., A. E. Staley Co., Box 151, 22nd & Eldorado Sts., Decatur, Ill.
- GEARY, BERNARD J.**, Cost Engineer, Production Engineering, Linde Co., Div. of Union Carbide Corp., P. O. Box 152, Tonawanda, N.Y.
- GELZER, SEYMOUR G.**, 51 Glenwood Ave., Jersey City, N.J. (NY)
- GEORGE, WALTER T.**, Asst. to Controller, Eastern Chemical Div. Headquarters, Hooker Chemical Corp., 47th & Buffalo Ave. Niagara Falls, N.Y. (NY)
- GERALDINE, DESMOND G.** (Charter), Chief Estimator, Estimating Dept., The Fluor Corp., P. O. Box 7030, ELA Branch, Los Angeles 22, Calif. (SC)
- GERTZ, STANLEY A.**, Mgr., Computer Operations Div., Administrative Engineering Dept., M. W. Kellogg Co., 711 Third Ave., N.Y., NY (NY)
- GESSER, MORRIS E.**, Cost Control Analyst, Engineering Dept., E. I. du Pont de Nemours & Co., Inc., P. O. Box 1217, Parkersburg, W. Va.
- GIBBONS, EDWARD J.**, Supervisor, Mechanical Services, Household Products Research Dept., Colgate-Palmolive Co., 105 Hudson St., Jersey City 2, N.J. (NY)
- GIBSON, MARTIN J., JR.**, Systems Analyst, Contract Operations, The M. W. Kellogg Co., 711 Third Ave., N.Y. 17, N.Y. (NY)
- GILBERT, FRANCIS B.**, General Supervisor-Estimating, Estimating Dept., Consolidated Western Steel Co., 5700 S. Eastern Ave., Maywood, Calif. 602 S. Newlin Ave., Whittier, Calif.
- GILBERT, OSCAR G., JR.**, Mgr., Process Development, Research & Development Dept., The Quaker Oats Co., Quaker Oats Research Lab., 617 W. Main St., Barrington, Ill. (CM)
- GILMORE, JOHN F., JR.** (Founder), Principal Engineer, Engineering Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia, Pa. 18 Candytuft Rd., Levittown, Pa.
- GLASER, LEO B.**, Construction Engineer, Construction Dept., The Lummus Co., 146 Haynes Ave., Newark, N. J. 99 Orion Rd., Berkeley Heights, N.J.
- GLENN, FREDERICK, JR.**, Sr. Cost Engineer, Cost Engineering Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. 171 Porter Ave., Bergenfield, N.J. (NY)
- GLOVER, JOSEPH H.**, Asst. Supervisor, Technical Dept., Esso Petroleum Co. Ltd., Refinery Dept., Fawley, Hants, England. "Heatherlea", East End, Lyngington, Hants, England.
- GODDARD, RALPH J.**, Rider Hunt & Partners, Bridge House, Queen Victoria St., Blackfriars, E. C. 4, England.
- GODFREY, ROBERT S.**, Chief Engineer, R. S. Means Co., Snug Harbor, Duxbury, Mass.
- GOLD, JAMES E.**, Estimator, Estimating Dept., Bridge & Tank Western Ltd., Sutherland & Maple Sts., Winnipeg 2, Manitoba, Canada.
- GONDA, JOHN E.**, Sr. Estimator, Estimating & Budgeting Dept., Koppers Co., Inc., 3018 Koppers Bldg., Pittsburgh 19, Pa. (P)
- GOODKIND, ROBERT L.**, Statistical Engineer, Engineering Dept., Pittsburgh Plate Glass Co., Chemical Div., P. O. Box 1000, Lake Charles, La.
- GOREY, JAY M.** (Founder), Cost Engineer, Cost Engineering Dept., Planning Engineering Div., Esso Research & Engineering Co., P. O. Box 209, Florham Pk., Madison, N.J. (NY)
- GOUDSTIKKER, JEAN.** Cost Engineer, Ingenieria Hidraulica y Civil, Av. Mariano Escobedo No. 724, 4th Floor, Mexico, D. F. Mexico. 131-24 Amsterdam, Mexico 11 D. F., Mexico.
- GRAHAM, FRANK.** Estimating Engineer, Proposal & Estimating Dept., Chemical Construction (GB) Ltd., Henrietta House, Henrietta Place, London, W. 1, England. "Kedron"—Crescent Rd., Bishops, Stortford, Hertfordshire, England.
- GRAY, WILLIAM R.**, Power & Fuel Engineer, Engineering Dept., Inland Steel Co., 3210 Watling St., E. Chicago, Ind. 6902 Delaware St., Crown Point, Ind. (CM)
- GRAY, WILLIAM W.**, Sr. Estimator, Petrochemical Estimating Dept., The Ralph M. Parsons Co., 617 W. Seventh St., Los Angeles 17, Calif. 1129 E. Beverly Way, Altadena, Calif. (SC)
- GREENLUND, CHARLES E.**, Estimating Coordinator, Struthers-Wells Corp., 1003 Pa. Ave., W. Warren, Pa. (P)
- GRIEBENOW, NEIL B.**, Cost Engineer, Central Engineering Dept., Wood Conversion Co., 1900 W. First National Bank Bldg., St. Paul 1, Minn.
- GRIERSON, KEITH E.**, Central Engineering Dept., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland, Ohio. (NO)
- GRIFFIN, STANLEY H.** (Charter), Process Engineer, Process Engineering Dept., Kraft Foods, Div. of National Dairy Products Corp., 500 Peshtigo Ct., Chicago 90, Ill. (CM)
- GRIFFITHS, ROBERT L.** (Charter), Project Engineer, Project Engineering Dept., Engineering Div., Merck & Co., Inc., Rahway, N.J. (NY)
- GROSVENOR, FRANK.** Sr. Cost Standards Engineer, Engineering Div., Ontario Hydro-Electric Power Commission, 620 Univ. Ave., Toronto 2, Ontario, Canada.
- GUERIN, HENRY J.**, Supervising Estimator, Bechtel International Ltd., 18-24 Howland St., London, W. 1, England.
- GUTHRIE, KENNETH M.**, Proposal Engineer, Proposal Div., The M. W. Kellogg Co., 711 Third Ave., N.Y. 17, N.Y. (NY)
- HACKNEY, JOHN W.** (Founder), Vice-Pres., Pan-American Management Ltd., Shell Tower Bldg., Montreal, P. Q. Canada. 1375 Sherwood Crescent, Apt. 255, Montreal 16, P. Q., Canada.
- HAMILTON, GENE E.**, Mgr., Process Analysis, Technical Economics, Research & Engineering Dept., Sun Oil Co., Box 426, Marcus Hook, Pa. (DV)
- HAMPSON, MAURICE.** Sr. Estimating Engineer, Contract Estimating Dept., McKee Head Wrightson Ltd., 16-26 Baltic St., London, E. C. 1, England, 53 Northfield Rd., Waltham Cross, Herts, England.
- HAND, WILLIAM E.** (Charter), Head, Costing & Appraisals Dept., Shell Development Co., Emeryville, Calif. (SF)
- HANDZA, GEORGE E.**, Estimator, Hydrocarbon Research Inc., 115 Broadway, N.Y., N.Y. 125 Florence Ave., Westfield, N.J.
- HARDING, RUSSELL J.** (Associate), Asst. Field Office Mgr., Transmission Lines & Switchyard, Uhl, Hall & Rich, 2600 Main St., Niagara Falls, N.Y. 529 Northfield Dr., Youngstown, N.Y. (NF)
- HARDY, WALTER L.** (Charter), Technical Director, Accent International Div., International Minerals & Chemical Corp., Old Orchard Rd., Skokie, Ill.
- HARRISON, KENNETH E.**, Construction Cost Analyst, Real Estate & Mortgage Loan Dept., N. Y. Life Insurance Co., 51 Madison Ave., N.Y. 10, N.Y. (NY)
- HARRISON, VICTOR A.**, Acting Mgr., Construction Planning Dept., Ontario-Hydro Electric Power Commission, 620 Univ. Ave., Toronto 2, Ontario, Canada.
- HASELBARTH, JOHN E.**, Valuation Engineer, Industrial Dept., Pritchard & Abbott Engineers, 2550 W. Holcombe Blvd., Houston 25, Tex. (GC)
- HAWKES, ERNEST.** Cost Estimating Engineer, Cost Dept., Gwynnes Pumps Ltd., 62-64 Chancellors Rd., Hammersmith, London, W. 6, England.
- HAYS, JOHN R.**, Planning & Coordination Dept., Hughes Tool Co., P. O. Box 2539, Houston 1, Tex. (GC)
- HEATH, SETH VICTOR.** Salesman, Warren Electric Co., 2112 Walker Ave., Houston, Tex. 5310 Grape Rd., Houston 35, Tex.
- HECK, JOAQUIM L.**, Sales Estimator, Sales Dept., Linde Co., Div. of U. C. C., 270 Park Ave., N.Y. 17, N.Y. (NY)
- HEDGE, THOMAS E.** (Associate), Chemical Engineer, Research Dept., Diamond Alkali Co., Research Ctr., Diamond Alkali Co., P. O. Box 348, Painesville, Ohio, 23241 Lakeshore Blvd., Euclid 23, Ohio.
- HELLENACK, LESIE J.** (Associate), Estimating Engineer, Estimating Dept., The M. W. Kellogg Co., 711 Third Ave., N.Y. 17, N.Y., 260 Oak St., Apt. No. G-1, Ridgewood, N. J.
- HAMMERICH, ROLF H.**, Sect. Leader Economics, Research & Development Dept., Plastics & Resins Div., Shell Chemical Co., 110 W. 51st St., N.Y. 20, N.Y. (NY)
- HENKEL, STEPHEN C.** (Associate), Asst. Project Engineer, Iron & Steel Dept., The M. W. Kellogg Co., 711 Third Ave., N.Y. 17, N.Y.
- HEPDITCH, GORDON D.** (Associate), County Assessor, Assessment Dept., County of Ontario, 416 Centre St., S. Whitby, Ontario, Canada.
- HERBERT, JOHN H.**, Sr. Estimating Engineer, Engineering Dept., Kellogg International Corp., 7-10 Chandos St., London, W. 1, England. 6 Galton Rd., Westcliff-on-Sea, Essex, England.
- HERMANN, RICHARD C.**, Construction Cost Engineer, Gen. Engineering Dept., Aluminum Co. of Canada, P. O. Box 6090, Montreal, P. Q., Canada.
- HERR, RICHARD B.**, Sr. Estimator, Engineering Dept., El Paso Natural Gas Co., P. O. Box 1492, El Paso, Tex.
- HERSCHEL, GEORGE T.**, Construction Supt., Construction—Gen., Day & Zimmerman, Inc., P. O. Box 561, Niagara Falls, N.Y. 146 Park Ave., Swarthmore, Pa.
- HESELGRAVE, PAUL A.**, Chief Estimator, Atomic Power Equipment Dept., General Electric Co., P. O. Box 254, San Jose, Calif. (SF)
- HILLER, MURRAY L.**, Estimating Supervisor, Omaton Div., Burndy Corp., Richards Ave., Norwalk, Conn. (NY)

- HILLMAN, VERNE R.** (Associate), Head of Estimating & Methods Depts., Production Dept., NRC Equipment Corp., 160 Charlemont St., Newton Highlands 61, Mass. 204 Grove St., Auburndale 66, Mass. (NE)
- HILTON, WILLIAM R.** (Charter), Sr. Research Engineer, Textile Fibers Dept., Centre Rd. Bldg., DuPont Co., Wilmington 98, Del.
- HINES, HOLLIS B., JR.**, Chief Cost Engineer, Cost & Office Administration, Bowaters Engineering & Development Inc., Calhoun, Tenn.
- HIRSCH, JOEL H.** (Charter), Director, Development Engineering Div., Gulf Research & Development Co., P. O. Box Drawer 2038, Pittsburgh 30, Pa.
- HIRSCHHORN, GERARD W.**, Mgr., Marketing Research, Sales Dept., Wood Conversion Co., First National Bank Bldg., St. Paul 1, Minn.
- HIRT, CHARLES R.** (Founder), Head, Construction Cost Engineering Sect., Engineering Div., The Procter & Gamble Co., ITC Building, Ivorydale, Cincinnati 17, Ohio.
- HISCOX, WILLIAM**, Chief Estimator, Engineering Dept., The Associated Ethyl Co. Ltd., Ellesmere Port—Oil Sites Rd., Cheshire, England.
- HISS, CHARLES** (Associate), Mgr. of Engineering Staff, Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio. 275 Harcourt Dr., Akron 13, Ohio.
- HITCHCOCK, MELVILLE E.**, Coordinator, Overseas Chemicals Production, Operations Dept., Union Carbide International Co., 270 Park Ave., N.Y. 17, N.Y. (NY)
- HITER, S. WILLIAM** (Associate), Clerk Computer, Cost Dept., Uhl, Hall & Rich, 2620 Main St., Niagara Falls, N.Y. (NF)
- HOBSON, TIMOTHY J.**, Project Engineer, Waterpower Div., British Newfoundland Corp. Ltd., 1980 Sherbrooke St. W., Rm. 720, Montreal 25, P.Q., Canada.
- HOFFMAN, EDWARD C.** (Charter), Standards Engineer, Engineering Design & Development Dept., Merck & Co. Inc., Rahway, N.J.
- HOFFMAN, GEORGE J.** (Associate), Estimator, Estimating Dept., General Chemical Div., Allied Chemical Corp. 1100 Lime St., Camden 3, N. J., 416 Brentwood Rd., Havertown, Pa. (DV)
- HOLDEN, STANLEY F.**, Estimating Engineer, Estimating Dept., Matthew Hall & Co. Ltd., 101-108 Tottenham Court Rd., London, W. 1, England. 40 Rudland Rd., Barnehurst, Bexleyheath, Kent, England.
- HOLLAND, HAROLD W.**, Sr. Estimator, Estimating Dept., Catalytic Construction of Canada Ltd., 149 N. Victoria St., Sarnia, Ontario, Canada.
- HOLLENBECK, C. EDWARD**, Sr. Electrical Engineer, Electrical Engineering Dept., Kaiser Engineers, P. O. Box 217, Richland, Wash. (SF)
- HOLLIDAY, GEORGE R.**, Sr. Estimating Engineer, Estimating Dept., Matthew Hall & Co. Ltd., 101/108, Tottenham Court Rd., London, W. 1, England. 16 Burns Rd., Pound Hill, Crawley, Sussex, England.
- HOLLOWAY, ALLAN T.**, Chief-Cost Control, Construction Dept., Diversified Builders, Inc., A. Div. of Maceo Corp., 588 E. Rosecrans Blvd. Paramount, Calif. 12603 Longleaf Drive, La Mirada, Calif. (SC)
- HONOHAN, EDWARD J.**, Development Supervisor, Chemical Research and Development Dept., Charles Pfizer & Co., Inc., 11 Bartlett St., Brooklyn 6, N.Y. (NY)
- HOON, REGINALD K.**, Asst. Supervisor, Cost Engineering Dept., Dravo Corp.—Machinery Div., Dravo Bldg., 5th & Liberty Avenues, Pittsburgh 22, Pa. (P)
- HOPKINS, RAY** (Charter), Engineer, Engineering Dept., Monsanto Chemical Co., Box 1311, Texas City, Tex. (GC)
- HOPPER, RICHARD G.**, Mgr., Cost Dept., Uhl, Hall & Rich, P. O. Box 327, Niagara Falls, N.Y. (NF)
- HORST, JAMES D.**, Mgr., Cost Control, Cost Engineering Dept., The Ralph M. Parsons Co., 617 W. 7th St., Los Angeles 17, Calif. (SC)
- HORSTMAYER, A. L.**, Pres., Wm. Horstmayer Co., 23 Mars St., San Francisco 14, Calif. (SF)
- HOSFELT, MILLARD L.**, Asst. Mgr. of Estimating, Estimating Dept., Fluor Corp. Ltd., 2500 S. Atlantic Blvd., Los Angeles 22, Calif. (SC)
- HOVEY, P. B.**, Project Engineer, Technical Dept., Associated Electrical Industries Export Ltd., 33 Grosvenor Place, London, S. W. 1, England. 156 Elmbridge Ave., Surbiton, Surrey, England.
- HOWE, LLEWELLYN S.**, Research Dept., Olin Mathieson Chemical Corp., 460 Park Ave., N. Y. 22, N.Y. (NY)
- HOYT, JAMES G.**, Specialist, Atomic Power Equipment Dept., General Electric Co., 2151 S. First St., San Jose, Calif. (SF)
- HRISHIKESAN, DR. KIZHAKKE G.**, Technical Asst., Alumina Research Dept., Reynolds Metals Co., Hurricane Creek Plant, Bauxite, Ark.
- HUBBELL, LUMAN G.**, Mgr., Construction Engineering Dept., Linde Co. Div. of Union Carbide Corp., P. O. Box 152, Tonawanda, N.Y.
- HUBER, J. PAUL**, Estimator, Engineering Dept., Gen. Chemical Div. Allied Chemical Corp., 1100 Lime St., Camden, N.J. (DV)
- HUEY, EUGENE A.**, Sr. Engineer, Engineering Div., National Lead Co. of Ohio, P. O. Box 39518, Cincinnati 39, Ohio.
- HUFFMAN, GENE C.**, Mgr., Project Sect. & Estimating Sect., Central Engineering Staff (110D), Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio. 8021 Valley View Rd., Hudson, Ohio. (NO)
- HUGLSON, ROY V.**, Asst. Editor, Chemical Engineering, McGraw-Hill Publishing Co., 330 W. 42nd St., N.Y. 36, N.Y.
- HUMMEL, HERBERT**, Vice-Pres., Estimating & Construction Dept., The Penker Construction Co., 1030 Summer St., Cincinnati 4, Ohio.
- HUNN, WILLIAM R., JR.**, Estimator, Research Engineering Dept., Sun Oil Co., 1616 Walnut St., Philadelphia 3, Pa. (DV)
- HUPP, HOMER M.**, Estimator, Estimates & Budgeting E & C Div., Koppers Co., Inc., 3018 Koppers Bldg., Pittsburgh 19, Pa. (P)
- HUTTENLOCHER, HARVEY H.**, Chief Estimator, Project Design & Estimating Dept., National Carbon Co., Inc., P. O. Box 6087, Cleveland, Ohio (NO)
- ISHKOW, N. (Associate)**, Estimator, Engineering & Construction Dept., L'Air Liquide, 1210 Sherbrooke W., Montreal, P. Q., Canada.
- JACKSON, HERBERT B.**, Project Engineer, Mechanical Dept., Turner & Collier Consulting Engineers, Inc., 2111 C & I Life Bldg., Houston 2, Tex. (GC)
- JACOBS, JAMES H.**, Engineer, Atomic Power Dept., Westinghouse Electric Corp., P. O. Box 355, Pittsburgh 30, Pa.
- JAMES, MAURICE G.**, Estimating Mgr., Engineering Estimating Dept., Air Products (GB) Ltd., St. Giles House, Poland St., London, W. 1, England. 31 Little Woodcote Lane, Purley, Surrey, England.
- JANZ, JOHN J.**, Chief Estimator, Estimating Dept., Bridge & Tank Western Ltd., Sutherland & Maple Streets, Winnipeg 2, Manitoba, Canada.
- JARRELL, WILLIAM A.**, Chief Estimator, Civil Engineering Dept., Lockwood, Andrews & Newnam, Consulting Engineers, P. O. Box 13332, Houston 19, Tex. (GC)
- JENCKES, LESLIE C.**, Engineer, Engineering Economics Dept., Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa. (DV)
- JIPA, ALEXANDRE C.** (Associate), Estimator—Group Leader Process Equipment, Industrial Div., Canadian Vickers Ltd., P. O. Box 550—Place D'Armes, Montreal, P. Q., Canada.
- JOHNSON, ALLAN L.** (Associate), Estimator, Engineering Dept., Paso Natural Gas Co., P. O. Box 1492, El Paso, Tex. 2609 Wedgewood, El Paso, Tex.
- JOHNSON, EDWARD A.**, Engineering Estimator, Estimating Dept., Bethlehem Pacific Coast Steel Corp., 20th & Illinois Streets, San Francisco 19, Calif. 3241 Sterling Ave., Alameda, Calif. (SF)
- JOHNSON, EDWIN M.**, District Contracting Mgr., Contracting Dept., U. S. Steel Corp., American Bridge Div., 1413 Statler Office Bldg., Boston 16, Mass. (NE)
- JOHNSON, LEE T.**, Sr. Staff Engineer, General Engineering Dept., American Oil Co., Box 710, Whiting, Ind. (CM)
- JOHNSON, PHILIP E.** (Associate), Cost Engineer, Engineering Dept., Lavoie Machine & Tool Co., 120 Mountain Ave., Malden 48, Mass. (NE)
- JOHNSON, WILLIAM C.**, Production Engineer, Chemical Engineering Dept., The Upjohn Co., Portage Plant, Kalamazoo, Mich.
- JONES, EARLE L.**, Pres., Earle L. Jones & Associates, 7135 Empire Freeway, Dallas, Tex. 2818 Searcy Drive, Dallas 11, Tex.
- JONES, ROBERT E.**, Supervisor—Estimating Group, Mfg. Dept., General Engineering Div., The Standard Oil Co. (Ohio), Midland Bldg., Cleveland 15, Ohio (NO)
- JOYCE, ROBERT D.**, Supt., Work Order Dept., Natural Gas Pipeline Co. of America, 122 S. Michigan Ave., Chicago, Ill. (CM)
- JOYCE, THOMAS J.**, Chemical Engineer, Process Economics Evaluation Staff, U. S. Bureau of Mines, P. O. Box 880, Morgantown, W. Va. 1340 Fairfield St., Morgantown, W. Va.
- JUNKER, THOMAS J.** (Founder), Assoc. Research Engineer, Research & Development Dept., Pittsburgh Chemical Co., Neville Island, Pittsburgh 25, Pa. (P)
- KAHN, KENNETH**, Industrial Engineer, Leutenkenny Ordnance Depot, U. S. Army, Chambersburg, Pa. Rt. No. 3, Shippensburg, Pa. (P)
- KALAL, ROBERT F.** (Associate), Estimator on Prices, Costs & Records Dept., Cleveland Electric Illuminating Co., P. O. Box 5000, Cleveland 1, Ohio. (NO)
- KARAY, ALEXANDER X.** (Founder), Sr. Project Engineer, Engineering Dept., Miles Chemical Co., 112 Myrtle, Elkhart, Ind.
- KARNS, ROBERT D.**, Sr. Process Engineer, Mobay Chemical Co., Penn Lincoln Pkwy. W., Pittsburgh 5, Pa. (P)
- KATELL, SIDNEY** (Founder), Project Coordinator—Process Evaluation Dept., Morgantown Coal Research Ctr., P. O. Box 880, Morgantown, W. Va.
- KEANE, CHARLES V.**, Engineer, Estimating Dept., Metcalf & Eddy, 1300 Statler Bldg., Boston 16, Mass. (NE)
- KEATING, CHARLES J.**, Cost Estimating Engineer, Engineering Div., National Aniline Div. of Allied Chemical Corp., Elk St., Buffalo, N. Y. (NF)
- KEEFE, JOHN F.**, Development Engineer, Design Engineering Dept., Jones & Laughlin Steel Corp., 2709 E. Carson St., Pittsburgh 3, Pa. (P)
- KELEMEN, DANIEL J.**, Sr. Estimating Engineer, Engineering Estimating Dept., Air Products Inc., P. O. Box 538, Allentown, Pa.
- KELLEY, WILLIAM R.**, Program Planning Engineer, Armament & Control Sect., Light Military Electronics Dept., General Electric Co., 600 W. Main St., Johnson City, N. Y.
- KEMMNER, CHESTER A.**, Estimating Engineer, Engineering Dept., Pittsburgh Coke & Chemical Co., Neville Is., Pittsburgh 25, Pa. 34 Woodridge Drive, Carnegie, Pa. (P)
- KEMPER, ROBERT M.**, General Supervisor—Valuation Sect., Costs & Record Dept., The Cleveland Electric Illuminating Co., Box 5000, Cleveland 1, Ohio. 12933 Lake Ave., Lakewood 7, Ohio.
- KENDALL, WILLIAM K.**, Owner, W. K. Kendall, Contractor, Rm. 604, Hobard Bldg., 582 Market St., San Francisco 5, Calif. (SF)
- KENT, THOMAS JAMES, JR.**, Special Asst.—Vice Pres., Contract Operations, Operations Administration Dept., Kellogg International Corp., 7-10 Chandos St., London, W. 1, England.
- KETTNER, KARL H.**, Supervisor, Engineering Dept., American Overseas Petroleum Ltd., 485 Lexington Ave., N. Y. 17, N. Y.
- KILBERTUS, MICHAEL**, Chief Cost Engineer, General Engineering Dept., Aluminum Co. of Canada, Ltd., P. O. Box 6090, Montreal 3, P. Q., Canada.
- KING, WILLIAM C.** (Founder), Director, Market Research & Economic Analysis, Petrochemicals Dept., Gulf Oil Corp., P. O. Box 1166, Pittsburgh 30, Pa.
- KINGSMORE, JOHN E.**, Estimator, Estimating Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia, Pa.
- KIRBY, GERALD F.**, Deputy to Chief Estimating Engineer, Estimating Dept., Bechtel International Ltd., 18-29 Howland St., London, W. 1, England. 169 Clarence Crescent, Clapham Pk., London, S. W. 4, England.
- KIRBY, RALPH C.**, Chemical Engineer, Process Evaluation Dept., College Pk. Metallurgy Research Ctr., U. S. Bureau of Mines, College Park, Md. 116 Southwood Ave., Silver Spring, Md.
- KIRCHER, FREDERICK F.**, Cost Engineer, Cost Control Dept., Foster Wheeler Corp., 666 5th Ave. & 53rd St., N. Y. 19, N. Y.
- KLEBAN, BERNARD D.** (Founder), Chemical Engineer, Chemical Engineering Div., Hercules Powder Co., Research Ctr., 900 Market St., Wilmington, Del.
- KLUGE, WALTER H.**, Vice-Pres., Southern Industrial Piping Co., Inc., P. O. Box 74, Houston 1, Tex. (GC)
- KNOWLES, CHESTER L., JR.**, Mgr., Planning Engineering Dept., Engineering Div., Monsanto Chemical Co., Monsanto Ave., Springfield, Mass. (NE)
- KNUPP, J. RENE**, Asst. to Cost Engineer, Power Development Dept., Hydro-Quebec, Carillon, P. Q., Canada. 6346 Chateaubriand Ave., Montreal 10, P. Q., Canada.
- KONIGEL, HAROLD F.**, Estimator, Fisk Electric Co., 3102 Milam, Houston 6, Tex. (GC)
- KOPROSKE, ALBIN F.**, Project Engineer, Work Order Dept., Natural Gas Pipeline Co. of America, 122 S. Michigan Ave., Chicago 3, Ill. (CM)
- KULP, KENNETH A.**, Project Cost Analyst, Costs & Methods Dept., Cleveland Electric Illuminating Co., P. O. Box 5000, Cleveland 1, Ohio. (NF)
- KUNBERGER, HARRY A.**, Sr. Cost Analyst, Refining Div., The Pure Oil Co., 200 E. Golf Rd., Palatine, Ill. (CM)
- KURDYS, C. T.**, Administrative Engineering, Central Engineering Dept., Celanese Corp. of America, P. O. Box 141, Charlotte 1, N. C. 532 Jefferson Drive, Charlotte 7, N. C.
- KURS, DEXTER**, Sr. Engineer, Cost Engineering Dept., American Cyanamid Co., 30 Rockefeller Plaza, N. Y. 20, N. Y.
- KWAPIL, JAMES R.** (Associate), Johnson & Mape Construction Co., 540 Santa Cruz Ave., Menlo Park, Calif. (SF)
- LABOVITZ, CARL**, Project Engineer, Engineering Dept., The Rust Engineering Co., 930 Ft. Duquesne Blvd., Pittsburgh 22, Pa. (P)
- LA FAUCE, JOSEPH A.**, Joseph A. La Fauce & Co., 80 Boylston St., Boston 16, Mass. (NE)

- LAING, ROBERT**, Project Engineer, Glass Div., Engineering Dept., Planning & Estimating Sect., Pittsburgh Plate Glass Co., 632 Ft. Duquesne Blvd., Pittsburgh 22, Pa. (P)
- LaMONT, EDWIN F.**, Owner, Texas Estimating Co., P. O. Box 19372, Houston 24, Tex.
- LANDIS, BRUCE R.** (Founder), Research Engineer, Systems Management Dept., Aerospace Div., Boeing Aircraft Co., Seattle, Wash. 7107 34th Ave., N. W., Seattle 7, Wash.
- LANE, BRUCE S.** (Charter), Director of Engineering, Engineering & Maintenance Div., The Upjohn Co., 7171 Portage Rd., Kalamazoo, Mich.
- LANE, SAMUEL M.**, Sect. Leader-Engineering Development, Research & Development Dept., Va.-Carolina Chemical Corp., 818 Perry St., Richmond 8, Va.
- LANG, HANS J.**, Mgr., European Sales, Sales Dept., C. F. Braun & Co., 20 Eastbourne Terr., London, W. 2, England.
- LANGHOFF, WALTER H.**, Chief, Estimating Dept., Metcalf & Eddy, 1300 Statler Bldg., Boston 16, Mass. (NE)
- LARSON, ARTHUR W.**, Project Chemical Engineer, Research & Development Dept., Standard Oil Co. (Ind.), 2500 N. Y. Ave., Whiting, Ind.
- LASSITER, JACK**, Estimator, 4406 Kingfisher, Houston 35, Tex. (GC)
- LAVINE, IRVIN** (Founder), Prof. of Chemical Engineering, Univ. of N. H., Durham, N. H. & Secy.-Treas. Industrial Research Service, Masonic Bldg., Dover, N. H.
- LEE, DAVID G. J.**, Estimator, Estimating Dept., Canadian Bechtel Ltd., 100 Univ. Ave., Toronto, Ontario, Canada. 9 Fareham Crescent, Scarborough, Ontario, Canada.
- LEE, HOWARD H.**, Cost Engineer, Cost Control Dept., Process Plants Div., Foster Wheeler Corp., 666 Fifth Ave., N. Y. 19, N. Y. 20-42 Crescent St., Apt. 2A, Long Island City 5, N. Y. (NY)
- LEFELHOCZ, JOSEPH R.**, Cost Estimator, Central Engineering Dept., Diamond Alkali Co., Union Commerce Bldg., Cleveland, Ohio. 1201 Johnnycake Ridge, Painesville, Ohio.
- LENT, DONALD P.**, Sr. Estimator, Estimating Dept., Bechtel Corp., 485 Lexington Ave., N. Y. 17, N. Y.
- LEUCHTER, ROMAN A.**, Project Analyst, Chemicals Div., Canadian Industries Ltd., P. O. Box 10, Montreal, P. Q., Canada.
- LEWIS, EDWARD D.**, Partner, Lewis-Dickerson Associates, offices at 107 Iroquois Ave., W. Watertown, N. Y. & 225 Ctr. St., Massena, N. Y. P. O. Box 5, Massena, N. Y.
- LINDAHL, DONALD R.**, Chemical Engineer, Research & Development Div., Consolidation Coal Co., Library, Pa. (P)
- LINDQUIST, LLOYD V.**, Pres., Lindquist-McNely Co. Inc., 996 66th Ave., Oakland 21, Calif. 6948 Colton Blvd., Oakland 11, Calif. (SF)
- LISH, THADDEUS C.**, Head Engineer, Refinery Estimating Dept., Whiting Refinery, American Oil Co., Whiting, Ind. 8150 Greenwood Ave., Munster, Ind. (CM)
- LISS, BERNARD I.**, Estimator, Central Engineering Dept., Air Reduction Co., Inc., 150 E. 42nd St., N. Y. 17, N. Y.
- LITT, DANIEL**, Mgr.-Contract Status, Compotters Div., The M. W. Kellogg Co., 711 Third Ave., N. Y. 17, N. Y.
- LOCKE, RALPH M.**, Project Coordinator, Integrated Project Engineering Dept., Beloit Iron Works, Beloit, Wis.
- LONG, DR. JOHN R.** (Founder), Chemical Engineer, Engineering Dept., Hercules Powder Co., Delaware Trust Bldg., Wilmington 99, Del. 238 Sandra Rd., Fairfax, Wilmington 3, Del.
- LONG, HAROLD W.**, Chemical Engineer, Project Evaluation Dept., B. F. Goodrich Chemical Co., Avon Lake Development Ctr., Box 122, Avon Lake, Ohio.
- LOTHROP, ARTHUR P.**, Appropriations Control Engineer, Engineering Div., Universal Atlas Cement, A Div. of U. S. Steel Corp., 100 Pk. Ave.-Rm. 208, N. Y. 17, N. Y. (NY)
- LOVETT, JOHN F.** (Charter), Chief Project Engineer, Engineering Dept., Pittsburgh Coke & Chemical Co., Neville Is., Pittsburgh 25, Pa. (P)
- LOW, LAWRENCE W.**, Planning Engineer, Planning Dept., Chemical Div., Pittsburgh Plate Glass Co., One Gateway Ctr., Pittsburgh 22, Pa.
- LOWMAN, MALDEN C. JR.**, Engineer, Industrial Chemicals Project Development Dept., Shell Development Co., Emeryville, Calif. (SF)
- MacDONALD, JAMES W.**, Mgr., PROCOFRANCE, 56 Avenue Hoche, Paris 8E, France.
- MACHIN, ROBERT P.** (Associate), Sr. Estimator, Western Milling Divisions, Engineering Dept., Kennecott Copper Corp., 1515 Mineral Square, Salt Lake City, Utah. 2759 E. 2880 S., Salt Lake City 9, Utah.
- MACKELLAR, ARTHUR J.**, Pres., Cal-Coast Contractors, Inc., 23850 Hawthorne Blvd., Torrance, Calif. 3 Acacia Rd., Rolling Hills, Calif. (SC)
- MacLACHLAN, WILLIAM A.**, Chief Estimator, Estimating Dept., Catalytic Construction of Canada, Ltd., 149 N. Victoria St., Sarnia, Ontario, Canada.
- MacLENNON, JOHN**, Director, Administrative Facilities, Administrative Dept., International Minerals & Chemical Corp., Old Orchard Rd., Downers Grove, Ill. (CM)
- MAGNANTI, LEO** (Associate), Chief Estimator, Engineering Dept., Solvay Process Co., Solvay, N. Y.
- MAIER, LEONHARDT F.**, Gen. Engineer, Field Engineering Dept., J. George Stewart, Architect of the Capitol, 301 S. Capitol St., Washington, D. C. 721 McCabe Ave., Baltimore 12, Md.
- MAJOR, PAUL N.**, Group Leader-Estimating, Engineering Dept., Ethyl Corp., P. O. Box 341, Baton Rouge 1, La.
- MALARKEY, JOHN J.**, Estimator, Engineering Dept., Olin Mathieson Chemical Co., P. O. Box 2896, Lake Charles, La. (GC)
- MALKIN, H. HOWARD**, Chief Process Engineer, Technical Dept., Plastics & Coal Chemicals Div., Allied Chemical Corp., 2112 Sylvan Ave., Toledo 6, Ohio.
- MALPASS, JOHN I.**, Estimator & Specification Writer, Engineering Div., J. H. Pomeroy & Co. Inc., 755 Sansome St., San Francisco, Calif. (SF)
- MANN, LAWRENCE R.**, Mgr.-Engineering Estimating Sect., Engineering Dept., Air Products Inc., Box 538, Allentown, Pa.
- MARCHETTI, EMERINO J.**, Chemical Engineer, Administrative Engineering Dept., The M. W. Kellogg Co., 711 Third Ave., N. Y. 17, N. Y. 765 Bronx River Rd., Bronxville 8, N. Y.
- MARGY, JOHN P.** (Charter), Estimator, Cost Engineering Dept., The Ralph M. Parsons Co., 614 W. 7th St., Los Angeles 17, Calif. 6532 Vista St., San Gabriel, Calif. (SC)
- MARK, ERWIN J.**, Staff Engineer-Cost Control, Gen. Engineering Dept., The Pure Oil Co., 200 E. Golf Rd., Palatine, Ill. (CM)
- MARKLEY, ROBERT R.**, Estimator, Estimating Dept., Badger Mfg. Co., 363 Third St., Cambridge 42, Mass. 55 Coolidge Rd., Danvers, Mass. (NE)
- MARLOWE, GEORGE J.** (Charter), Asst. Vice-Pres. & Director of Gen. Engineering, Scientific Design Co. Inc., 2 Park Ave., N. Y. 16, N. Y.
- MARNET, HERMAN**, Design Engineering Dept., Merck Sharp & Dohme, Div. of Merck & Co. Inc., West Point, Pa. (DV)
- MARSIK, FERDINAND V.**, Administrative Asst., Planning Dept., Celanese Corp. of America, 180 Madison Ave., N. Y. 16, N. Y. 167 Concord Drive, River Edge, N. J. (NY)
- MASI, DOMINIC M. JR.**, Asst. Mgr., Estimating Div., The M. W. Kellogg Co., 711 Third Ave., N. Y. 17, N. Y. 9 Elm Place, Summit, N. J.
- MASON, HAROLD S.**, Rider Hunt & Partners, Bridge House, Queen Victoria St., Blackfriars, E. C. 4, England.
- MASTERS, RICHARD W.**, Gen. Supervisor-Design, Gen. Office Engineering Dept., U. S. Steel Corp., 9101 S. Exchange Ave., Chicago 17, Ill.
- MATTIZA, D. S.**, Planning Engineer, Pittsburgh Plate Glass Co., Chem. Div., P. O. Box 4026, Corpus Christi, Tex. (GC)
- MAYER, RICHARD L.**, Tech. Asst. to Chief Engineer, Engineering Dept., Consolidated Western Steel, Div. of U. S. Steel Corp., P. O. Box 2015, Terminal Annex, Los Angeles 54, Calif. (SC)
- MAYO, PAUL H.**, Staff Engineer, Engineering & Construction Dept., Caltex Service Co., 380 Madison Ave., N. Y. 17, N. Y. (NY)
- MAYURNIK, GEORGE**, Director, Latin American Chemical Development, Research & Development Div., W. R. Grace & Co., 3 Hanover Square, N. Y. 4, N. Y.
- McANINCH, BILLY E.**, Sr. Engineer, Plant Engineering Dept., Tex. City Refining, Inc., P. O. Box 1271, Tex. City, Tex. (GC)
- McCAHON, DAVID S.**, Estimating Engineer, Engineering Dept., Badger Mfg. Co., 363 Third St., Cambridge 42, Mass. (NE)
- McCARTHY, EUGENE R.**, Estimating Engineer, Pre-Contract Dept., Joy Mfg. Co., Western Precipitation Div., 1000 W. Ninth St., Los Angeles, Calif. 19842 Valerie St., Canoga Park, Calif.
- McCLANAHAN, DAVID N.** (Charter), Development Dept., Goliad Corp., 1135 Tex. National Bank Bldg., Houston 2, Tex. 12111 Taylorcrest, Houston 24, Tex.
- McINTYRE, CHARLES E. III** (Charter), Administrative Asst., Chemical Activities Dept., El Paso Natural Gas Products Co., P. O. Box 1161, El Paso, Tex. (GC)
- McKAY, JAMES W.**, Retired, 115 Ritchie Ave., Trail, B. C., Canada.
- McKAY, WILLIAM I.** (Charter), Mgr., Estimating, Engineering Estimating Dept., The Fluor Corp. Ltd., 2500 S. Atlantic Blvd., Los Angeles 22, Calif. (SC)
- McLAREN, S. GEORGE**, Staff Estimator, Estimates Dept., AETRON, A Div. of Aerojet-General Corp., 410 N. Citrus Ave., Covina, Calif. 523 W. Grandview, Sierra Madre, Calif. (SC)
- McLAREN, R. S.**, Chief Cost Engineer, Cost Engineering & Control Dept., Shawinigan Chemicals Ltd., P. O. Box 330, Shawinigan Falls, P. Q., Canada.
- McLEOD, JAMES D.**, Contract Pricer, Marketing Dept., Autonetics (North American Aviation Inc.), Downey, Calif. 14424 San Feliciano Drive, La Mirada, Calif.
- MEIKLE, DONALD I.** (Charter), Controller, Accounting Dept., Meissner Engineers, Inc., 300 W. Washington St., Chicago 6, Ill. (CM)
- MELODY, PATRICK J.** (Associate), Chief Accountant, Stoner Mfg. Corp., 328 Gale St., Aurora, Ill. 837 Prairie St., Aurora, Ill. (CM)
- MERILINO, JOSEPH J.**, Estimator, Specifications & Estimates Dept., Tippetts-Abbett-McCarthy-Stratton, Consulting Engineers, 375 Pk. Ave., N. Y. 17, N. Y. 99 Colin St., Yonkers 2, N. Y. (NY)
- METCALF, JAMES E., JR.** (Charter), Consulting Engineer, Self-employed, 1511 Hazard, Houston 19, Tex. (GC)
- MEYERS, DONALD W.**, Special Projects Planning Mgr., Planning Dept., Celanese Fibers Co., A Div. of Celanese Corp. of America, Inc., P. O. Box 1414, Charlotte 1, N. C.
- MICHEL, E. WAYNE**, Estimator, Gen. Engineering Dept., Ethyl Corp., P. O. Box 341, Baton Rouge 1, La.
- MICHEL, GEORGE H.**, Mgr., Thermosetting Compounds Dept., American Cyanamid Co., Plastics & Resins Div., Wallingford, Conn. 33 Lawrence Rd., Hamden, Conn.
- MILES, CLIFFORD H. C.** (Associate), Cost Estimator, Estimating Dept., McKee Head Wrightson Ltd., 16-26 Baltic St., London, E. C. 1, England. 12F Lewis Flats, Chelsea, London, S. W. 3, England.
- MILLER, ALBERT J.**, Mechanical Engineer & Estimator, Engineering-Construction Dept., Southern Industrial Piping Co. Inc., P. O. Box 1, Tex. 6407 Heron, Houston 17, Tex. (GC)
- MILLER, C. ARTHUR** (Founder), Supervisor, Cost Studies & Scheduling, Engineering Dept., Canadian Industries Ltd., P. O. Box 10, Montreal, P. Q., Canada.
- MILLER, N. PHILIP**, Chief, Facilities, Engineering Div., Goddard Space Flight Ctr., Greenbelt, Md.
- MILLER, SLOANE E.**, Chief Estimator, Estimating Dept., Voorhees-Walker Smith Smith & Haines, 101 Pk. Ave., N. Y. 17, N. Y. 815 Ray Ave., Ridgefield, N. J. (NY)
- MILLER, WALLACE L.**, Chief Estimator, Estimating Dept., Humphreys & Glasgow (Canada) Ltd., Leslie St., Don Mills, Ontario, Canada. 16, The Donway E., Apt. 212, Don Mills, Ontario, Canada.
- MILLMAN, GEORGE**, Chief Engineer, Rich Construction Co. Inc., 15 Speedway Ave., Boston 34, Mass. 18 Bellefontaine Ave., Framingham, Mass. (NE)
- MILLS, HERBERT E.**, Cost Estimator, Engineering Dept., Gen. Chemical Div., Allied Chemical Corp., 1100 Line St., Camden 3, N. J. 220 Earlington Rd., Havertown, Pa. (DV)
- MILLS, VERNON E.**, Mechanical Engineer, Works Engineering Dept., Diamond Alkali Co., P. O. Box 686, Pasadena, Tex. (GC)
- MINCKLER, HOWARD G.**, Area Engineer, Engineering Dept., Alexander Construction Co., Inc., P. O. Box 65, Chester, Pa. 23 Rampart W., Rt. No. 26, Media, Pa.
- MOCZEK, EDWIN H.**, Chemical Engineer, Engineering Dept., Abbott Laboratories, 16th & Sheridan, N. Chicago, Ill.
- MOHR, ROBERT A.**, Sr. Staff Member, Process Development Dept., Research & Development Div., Spencer Chemical Co., Research Ctr., 9009 W. 67th St., Merriam, Kan.
- MONAHAN, THOMAS J.**, Sr. Engineer, Engineering Dept., Socony Mobil Oil Co., Inc., 150 E. 42nd St., N. Y. 17, N. Y.
- MOORE, THOMAS R.** (Founder), Chief Estimator, Research & Engineering Dept., Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa. (DV)
- MOOREHOUSE, GLEN W.**, Sr. Mechanical Engineer, Project Coordinating Dept., Tenn. Eastman Co., Kingsport, Tenn. 1408 Valley St., Kingsport, Tenn.
- MORTENSEN, LEONARD R.**, Supervisor, Engineering Dept., Air Products, Inc., P. O. Box 538, Allentown, Pa. 725 Glick Ave., Allentown, Pa.
- MOSSO, ANTHONY J.**, Exec. Vice-Pres., Auburn & Associates, Inc., 1051 Brinton Rd., Pittsburgh 21, Pa. (P)
- MOULE, THOMAS W.**, Administrative Architect, Arthur Vennier Co., 300 N. Ave., E. Westfield, N. J. 44 Grove Ave., Morris Plains, N. J. (NY)
- MULHOLLAND, FRANK J.**, Supervisor of Estimating, Engineering Dept., Gen. Chemical Div., Allied Chemical Corp., 1100 Line St., Camden 3, N. J. (DV)

- MUSSER, JAY C. (Charter), Vice-Pres., Mfg. Dept., Klein Chocolate Co., Brown St., Elizabethtown, Pa. (DV)
- MUSSER, SHELTON A., Chief, Technical Area Div., The Zia Co., Los Alamos, N. M. 4829 Trinity Drive, Los Alamos, N. M.
- MYLO, JOHN (Charter), Engineer-Estimator, Plant Engineering Dept., The Chemstrand Corp., Decatur, Ala. 401-12th St., Athens, Ala.
- NAGRO, JOSEPH G., Vice-Pres., Kellogg International Corp. (London) & Societe Kellogg (Paris); Comptroller, The M. W. Kellogg Co., 711 Third Ave., N. Y. 17, N. Y. (NY)
- NAHR, ERNEST V., Supervisor, Estimating & Cost Control, Engineering Dept., Ethyl Corp., P. O. Box 341, Baton Rouge 1, La.
- NEIBAUER, HERMAN, Engineer, Contract Administration Dept., Uhl, Hall & Rich Co., P. O. Box 327 Niagara Falls, N. Y. 252 Cherry St., Youngstown, N. Y. (NF)
- NELSON, WILBUR L., Prof. of Chemical Engineering, Univ. of Tulsa; Technical Editor, Oil & Gas Journal; Consultant, Petroleum Refinery Engineering, Business & Home Address the same: 1916 E. 38th St., Tulsa 5, Okla.
- NEMETH, BLASE V. (Founder), Mgr., Cost & Construction, Central Engineering Dept., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio. 840 Madison Ave., Painesville, Ohio (NO)
- NEWTON, ROBERT D. (Charter), Mgr., Operations Research Dept., Plumbing & Heating Div., American Radiator & Standard Sanitary Corp., 40 W. 40th St., N. Y., N. Y. 1071 Grant Ave., Pelham Manor, N. Y. (NY)
- NICHOLS, HERBERT L. JR., Earthmoving Consultant & Owner, North Castle Books, 212 Bedford Rd., Greenwich, Conn. (NE) (NY)
- NIEMI, CLARKE I., Chemical Engineer, Research Dept., Coppers Co., Inc., Verona Research Center, Box 128, Verona, Pa. (P)
- NISSLEY, JOHN K., Sr. Cost Engineer, Lincoln-Thunderbird Production Engineering Dept., Ford Motor Co., 20000 Rotunda Drive, Dearborn, Mich. 9970 Stout St., Detroit 28, Mich.
- NOBLE, EUGENE E., Mgr., Estimating Services, Mfg. & Engineering Dept., Gen. Foods Corp., 250 N. St., White Plains, N. Y. 40 Algonquin Rd., Yonkers, N. Y.
- NOHECHER, CLARENCE J., Cost Engineer, Central Engineering Dept., Republic Steel Corp., c/o Reserve Mining Co., Silver Bay, Minn.
- NONACS, EDGAR A. (Associate), Estimator, Construction & Engineering Dept., Linde Co., Div. of U.C.C., P. O. Box 152, Tonawanda, N. Y. (NF)
- NORDEN, ROBERT B. (Founder), Sr. Assoc. Editor, Chemical Engineering, 330 W. 42nd St., N. Y. 36, N. Y. (NY)
- NORDQUIST, LLOYD E., Chief Engineer, Engineering Dept., Cal-Coast Contractors, Inc., 23850 Hawthorne Blvd., Torrance, Calif.
- OBERSEIDER, J. LOUIS (Charter), Gas Supply Engineer, Gas Supply Dept., Pacific Lighting Gas Supply Co., 720 W. 8th St., Los Angeles 17, Calif. (SC)
- O'BRIEN, ALFRED B. JR., Staff Engineer, Technical Div., Humble Oil & Refining Co., P. O. Box 3950, Baytown, Tex.
- O'CONNELL, EDMUND F. (Charter), Chief Estimator, Central Engineering Dept., Air Reduction Co., Inc., 150 E. 42nd St., N. Y. 17, N. Y. (NY)
- O'CONNELL, EDWARD A., Cost Analyst, Design Engineer-Dept., Merck Sharp & Dohme Div., Merck & Co., West Point, Pa.
- O'CONNOR, WILLIAM J. (Founder), Mgr., Estimating Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia 2, Pa. (DV)
- O'DONNELL, JOHN G., Sr. Estimator, Catalytic Construction Co., 1528 Walnut St., Philadelphia 2, Pa.
- OFFENBACHER, HURLEY F., Supervisory Architectural Engineer, Design & Construction Div., Region 3, General Services Administration, 7th & D Sts., S. W., Washington, D. C. 1913 Locust Grove Rd., Silver Spring, Md.
- OHLRIDGE, CHARLES A., Supervisor of Estimating, Estimating Dept., Bldg. 49, The Dow Chemical Co., Midland Div., Midland, Mich.
- OJALA, IRVING R., Supervising Estimator, Canadian Bechtel Ltd., 5595 Pare St., Montreal 9, P. Q., Canada.
- OLSEN, WILLIAM L., Asst. Project Engineer, Engineering Dept., Merritt-Chapman & Scott Corp., Lewiston, N. Y. Rankill Park, Ransomville, N. Y.
- O'NEIL, ROBERT S., Chief Estimator, Estimating Dept., Atlas Construction Co. Ltd., 4781 St. Catherine St. W., Montreal 6, P. Q., Canada. 754 38th Ave., Lachine, P. Q., Canada.
- OPLINGER, DONALD S., Sr. Project Engineer, Engineering Dept., Air Products, Inc., P. O. Box 538, Allentown, Pa.
- ORSELLI, A. J., Vice-Pres., Estimating Dept., Bechtel Corp., 220 Bush St., San Francisco 4, Calif.
- O'SHELL, HAROLD E., Technical Supt., Head Office, Technical Dept., Insurance Co. of North America, 1600 Arch St., Philadelphia 1, Pa. (DV)
- PALMER, ARCHIE J. G., Sr. Estimating Engineer, Shell Chemical Co. Ltd., Marlborough House, 15-17 Great Marlborough St., London, W. 1, England.
- PALMER, GRAHAM C., Rider Hunt & Partners, Bridge House, Queen Victoria St., Blackfriars, E. C. 4, England.
- PALMER, HARRY B., Chief Cost Engineer, Cost Dept., Hawaiian Dredging & Construction Co. Ltd., P. O. Box 3468, Honolulu 1, Hawaii.
- PAPILLON, MARCEL W., Sect. Head, Process Economics, Technical Development Div., Research & Technical Dept., British Petroleum Co. Ltd., Popular House, Chertsey Rd., Sunbury on Thames, Middlesex, England.
- PAPFAS, HARRY JR., Director of Public Works, Dept. of City Engineer, City of Westminster, 14381 Olive St., Westminster, Calif. 218 Ventura St., Anaheim, Calif. (SC)
- PARKER, PAUL C., Sr. Economist, Economics Div., Midwest Research Institute, 425 Volker Blvd., Kansas City, Mo.
- PARKER, WILLIAM B., Estimator, Estimating Dept., Kaiser Engineers, Kaiser Ctr., 1924 Broadway, Oakland 12, Calif. 1 Las Aromas, Orinda, Calif. (SF)
- PARKISON, DR. ROBERT V. (Charter), Director, New Project Development Dept., Research & Development Div., Spencer Chemical Co., 610 Dwight Bldg., Kansas City 5, Mo.
- PATRASCU, ANGHEL (Associate), Cost Engineer, Engineering & Construction Dept., Canadian Liquid Air Co., 1210 Sherbrooke W., Montreal, P. Q., Canada.
- PATTERSON, LELAND W., SR., Chief Estimating Engineer, Engineering Dept., Pittsburgh Plate Glass, Co., Chemical Div., New Martinsville, W. Va.
- PATTERSON, WILLIAM H. (Charter), Cost Engineering Group Leader, Construction Dept., Procter & Gamble Co., Ivorydale, Technical Ctr. 4C02, Cincinnati 17, Ohio.
- PATTON, CLARENCE E., Right-of-Way Agent, Right-of-Way Dept., Houston Lighting & Power Co., P. O. Box 1700, Houston, Tex. (GC)
- PAUL, CHARLES C., Asst. Chief Estimator, Research & Engineering, Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa. (DV)
- PEARCE, ALBERT T., Sr. Estimating Engineer (Deputy Chief), Estimating Dept., Plowright Bros. Ltd., 195 Knightsbridge, London, S. W. 1, England. 139 Tilehurst Rd., Wandsworth Common, London, S. W. 18, England.
- PEASLEE, DANA N., Retired, 2 Linden Ave., Beach Bluff, Swampscott, Mass.
- PECKER, ALBERT, Cost Control Engineer, Construction Dept., The Lummus Co., 146-246 Haynes Ave. Newark 5, N. J. 380 Irvington Ave., Elizabeth, N. J.
- PEEK, GEOFFREY W., London Office, Rider Hunt & Partners, Bridge House, Queen Victoria St., Blackfriars, E. C. 4, England.
- PEEL, RANDOLPH L., Sr. Estimator, Estimating Dept., Bechtel Corp., 62 1st St., San Francisco, Calif. (SF)
- PEREZ RIOS, JOSE D., Head, Estimates & Cost Sect., Engineering & Construction Div., Puerto Rico Water Resources Authority, Stop 16½, Santurce, Puerto Rico.
- PERRY, JAMES W. (Founder), Asst. Director, Design & Construction Dept., Union Carbide Chemicals Co., P. O. Box 8361, S. Charleston 3, W. Va.
- PERRY, LOUIS L., SR., Estimator, Cost Control Dept., Dow Chemical Co., 2505 Fannin St., Houston, Tex. (GC)
- PERRY, ROBERT D., Cost Engineer, Cost Control Dept., United Engineers & Constructors Inc., 1401 Arch St., Philadelphia 5, Pa.
- PETERS, MAX S., Prof. & Head of Chemical Engineering, Chemistry & Chemical Engineering Dept., Univ. of Ill., 114 E. Chem. Bldg., Urbana, Ill.
- PETERSON, EARLE R., Sr. Engineer, Industrial Estimating Dept., Kaiser Engineers, 300 Lakeside Ave., Oakland, Calif. 15011 Churchill St., San Leandro, Calif. (SF)
- PETERSON, JOHN R., Staff Engineer, Metals Div., Reduction Engineering Dept., Kaiser Aluminum & Chemical Corp., 300 Lakeside Dr., Oakland 12, Calif. (SF)
- PFROMMER, JAMES E., Area Plant Extensions Engineer, Engineering Dept., Gen. Telephone Co. of Calif., 1314 Seventh St., Santa Monica, Calif. (SC)
- PICARDI, RALPH G. (Founder), Estimator, Estimating Dept., Artisan Metal Products, 73 Pond St., Waltham, Mass. 32 Carl Rd., Arlington, Mass.
- PIEKARSKI, JULIAN A., Economic Analyst, Economic Research Dept., A. O. Smith Corp., P. O. Box 584, 3533 N. 27th St., Milwaukee 1, Wis. (CM)
- PITTUCK, MURRAY F., Mgr., Planning, Methods & Cost Control, Construction Dept., Shawinigan Engineering Co. Ltd., Box 490, Shawinigan, Quebec, Canada.
- PLATZER, SVEN O. A., Civil Engineer, Managing Director, Widmark & Platzer AB, Oxenstiernsgatan 11, P. O. Box 27 126, Stockholm 27, Sweden.
- POELLHUBER, CHARLES, Power Engineer, Power Development Div., Quebec Hydro Electric Commission, 107 Craig St. W., Montreal, Quebec, Canada.
- POLTO, CARLO H., Estimator, Engineering Dept., Ethyl Corp., P. O. Box 341, Baton Rouge, La.
- PONDER, THOMAS C. (Charter), Petrochemicals Editor, Petroleum Refiner, P. O. Box 2608, Houston 1, Tex. (GC)
- POTOMA, JOHN J., Project Estimator, Refinery Div., Oil Estimating Dept., Arthur G. McKee & Co., 2300 Chester Ave., Cleveland 1, Ohio. 1922 Brookview Blvd., Parma 34, Ohio.
- PROSSER, DERYK P. B., Sr. Asst./Development Engineer, Research & Development Dept., The United Steel Companies Ltd., Swinden Laboratories, Moorgate, Rotherham, England.
- PUHARIC, JOSEPH A., JR., Superv. or Planning & Cost Control Dept., Blaw-Knox Co., Chemical Plants Div., 300 Sixth Ave., Pittsburgh 22, Pa. (P)
- PULLEN, LESLIE W., Mining Engineer, Engineering Dept., Union Carbide Ore Co., 270 Pk. Ave., N. Y. 17, N. Y. (NY)
- PULLEY, DAN P., Sr. Chemical Engineer, Research & Development Dept., Va-Carolina Chemical Corp., 214 Perry St., Richmond, Va. 2509 Skeet St., Richmond, Va.
- QUADE, ARTHUR G., Cost Engineer, Works Engineering Dept., Armco Steel Corp., Ashland, Ky.
- QUAST, NORMAN A. E., Cost Estimator, Engineering Dept., 47 Bldg., Dow Chemical Co., Midland, Mich.
- QUIGLEY, HARRY A., Sr. Engineer, Development Appraisal Dept., Atlas Powder Co., Wilmington 99, Del.
- QUINLAN, HARRY F., Resident Mgr., Marshall & Stevens, Inc., 4133 Woodfin St., Houston 25, Tex. (GC)
- RADOSHEVICH, MARKO, Sr. Cost Engineer, Dept. 202, Engineering Staff, Ford Motor Co., Box 2053, Dearborn, Mich. 7557 Russell St., Detroit 11, Mich.
- RADWANSKI, FRED S. (Charter), Pres. & Gen. Mgr., ENASCO—Engineering Associates, Inc., 207½ S. Bayler St., P. O. Box 8005, Pensacola, Fla. 104 Beech St., Pensacola, Fla.
- RAHE, CECIL R. (Associate), Methods Analyst, Production Engineering Dept., National Lead Co. of Ohio, Box 158, Cincinnati 39, Ohio.
- RALLS, JAMES M., JR., Sr. Technologist, Process Development Dept., Shell Chemical Co., 110 W. 51st St., N. Y. 20, N. Y. (NY)
- RALSTON, ARCHIBALD, Estimator, Engineering Dept., General Chemical Co., 1100 Lime St., Camden 3, N. J. 13 Highland Ave., Haddon Heights, N. J. (DV)
- RANKIN, HAROLD E. (Charter), Supervisor in Cost Control, Estimating Dept., Ralph M. Parsons Co., 617 W. 7th St., Los Angeles 17, Calif. 611 N. Chestnut St., La Habra, Calif.
- RATH, HERMAN, Mgr., Sales Proposal Dept., Von Kohn International Corp., Von Kohn International Bldg., White Plains, N. Y. (NY)
- RAWSON, ROBERT K. (Associate), Estimator-Engineer, Estimating-Engineering Dept., The Dow Chemical Co., Freeport, Tex.
- REHM, CHARLES W., Supt., Production Dept., Silicones Div., Union Carbide Corp., P. O. Box 180, Silversville, W. Va.
- REICHARDT, PAUL E., Director of Value Analysis, Value Analysis Dept., Washington Gas Light Co., 1100 H. St., N. W., Washington 5, D. C.
- REILLY, J. ALEXANDER, Supervisor, Estimating Dept., Scientific Design Co., Inc., 2 Park Ave., N. Y. 16, N. Y.
- REINHART, GREGORY M., Engineer, Process Dept., National Lead Co. Titanium Div., Carondelet Station, St. Louis 11, Mo. 6836 Crest Ave., Univ. City 30, Mo.
- REMESCH, ERNEST A., Project Engineer, Central Engineering Dept., Foote Mineral Co., Box 513, West Chester, Pa. (DV)
- REUL, CHARLES O., Production Engineer, Production Engineering Dept., West Bend Aluminum Co., West Bend, Wis.
- REUL, RAYMOND I., Coordinator, Industrial Engineering Dept., Food Machinery & Chemical Corp., 161 E. 42nd St., N. Y. 17, N. Y. (NY)
- REVAY, STEPHEN G., Chief Engineer, Construction Engineering & Estimating Dept., Dufresne Engineering Co., Ltd., 1832 Pie IX Blvd., Montreal 4, P. Q., Canada.
- REYNOLDS, DAVID G. (Charter), Sr. Estimator, Estimating Dept., C. F. Braun & Co., 1000 S. Fremont Ave., Alhambra, Calif. (SC)

- REYNOLDS, JOHN**, Project Estimating Engineer, Estimating & Technical Expenditure Dept., British Petroleum Co. Ltd., B. P. Project Büro, Graf Adolf Str 47, Düsseldorf, W. Germany.
- RHODES, E. L.**, Sr. Project Engineer, Central Engineering Dept., Dominion Tar & Chemical Co. Ltd., 1400 Metcalfe St., Montreal, P. Q. Canada.
- RHODES, TOM C.** (Charter), Sr. Estimator, Control Dept., Dow Chemical Co., Freeport, Tex. (GC)
- RICER, EDWARD J.**, Consulting Engineer, 634 Hudson St., Hoboken, N. J.
- RIDGWAY, RICHARD L.** (Charter), Sr. Estimator, Project Estimating Dept., C. F. Braun & Co., 1000 S. Fremont, Alhambra, Calif. (SC)
- RIGATTI, JOSEPH F.**, Mgr., Estimating & Budgeting Sect., Engineering & Construction Div., Koppers Co., Inc., 3018 Koppers Bldg., Pittsburgh 19, Pa. (P)
- RIGGIO, JAMES L.**, Administrative Asst. to Vice-Pres., Management Representative, Chile Steele Plant Management, Koppers Co., Inc., c/o Cia de Acero del Pacifico, Casilla 167-D, Santiago de Chile, South America. (P)
- RIND, GRAY**, Chief Design Engineer, Engineering Dept., Pittsburgh Coke & Chemical Co., Neville Island, Pittsburgh 25, Pa. (P)
- RITCHIE, ROSS A.**, Mgr. of Engineering, Central Engineering Dept., Electric Reduction Co. of Canada Ltd., 137 Wellington St. W., Toronto 1, Ontario, Canada.
- ROBARDS, BERT S.**, Mgr., Cost Engineering Dept., The Ralph M. Parsons Co., 617 W. 7th St., Los Angeles 17, Calif. 251 S. Mansfield Ave., Los Angeles 36, Calif.
- ROBERTS, O. R.**, Oil & Gas Dept., Stearns-Roger Mfg. Co., 660 Bannock St., Denver 4, Colo.
- ROBERTSON, KARL B.** (Founder), Administrative Asst. to Mgr., Engineering & Construction Dept., Dow Chemical Co., P. O. Box 72, Midland, Mich.
- ROBINSON, PARKER M.**, Sr. Engineer, Specifications of Estimating Dept., Wilsey, Ham & Blair, 111 Rollins Rd., Millbrae, Calif.
- ROBYN, GERRIT W.**, Chief Estimator, Engineering & Development Dept., Montreal Locomotive Works Ltd., Dixon St., Montreal, P. Q. Canada.
- ROCHE, THOMAS J.**, Engineer of Estimates, Estimating Div., Cook County Highway Dept., 130 N. Wells St., Chicago 6, Ill. 2114 Prairie St., Glenview, Ill. (CM)
- RODGERS, MARION W.**, Mgr., Estimating Sect., Engineering Dept., E. I. du Pont de Nemours & Co., Wilmington 98, Del. (DV)
- ROGERS, DANIEL**, Assoc. Engineer, Cost Analysis Sect., Engineering Dept., Socony Mobil Oil Co., 150 E. 42nd St., N. Y. 11, N. Y. 641 Shackamaxon Drive, Westfield, N. J. (NY)
- ROHRDANZ, RAY C.**, Consulting Engineer, 8250 Bonner Drive, Houston 17, Tex. (GC)
- ROJAS, GONZALO A.**, Estimating Dept., Sigdo Koppers S. A., Casilla 3284, Santiago, Chile, South America.
- ROLLINS, ELMER J.**, Projects Engineer, Technical Service, Atlantic Refining Co., 3144 Passyunk Ave., Philadelphia, Pa.
- ROMAC, JAMES J.**, Economic Analyst, Economic Analysis Div., Sinclair Research Laboratories, Inc., 400 E. Sibley Blvd., Harvey, Ill. 7109 Monroe Ave., Hammond, Ind. (CM)
- ROOS, E. F.**, Sr. Chemical Engineer, Research & Technical Dept., Texaco, Inc., P. O. Box 1499, Fort Arthur, Tex. 4690 Dellwood Lane, Beaumont, Tex.
- ROOT, STEPHEN E.**, Chief Estimator, Estimating Dept., Badger Mfg. Co., 363 Third St., Cambridge, Mass. (NE)
- ROSE, DR. AARON** (Charter), Member of the Technical Staff, Operations Div., United Technology Corp., P. O. Box 358, Sunnyvale, Calif. (SF)
- ROSE, ARTHUR** (Charter), Prof., Chemical Engineering, Pa. State Univ., Univ. Pk., Pa.; Technical Director & Pres., Applied Science Laboratories, Inc., State College, Pa. Address: Applied Science Laboratories, Inc., 140 N. Barnard St., State College, Pa.
- ROSENBERRY, ROBERT L.**, Chief Estimator, New Construction Branch, Design & Construction Div., Gen. Services Administration Co., 7th & D Sts., S. W., Washington 25, D. C. 6104 Walhonding Rd., Washington 16, D. C.
- ROSENTHAL, WILLIAM**, Project Mgr., Construction & Engineering Dept., James King & Son, Inc., 350 Fifth Ave., N. Y. N. Y. 336 Ft. Washington Ave., N. Y. 36, N. Y.
- ROSS, JACK E.**, Sr. Engineer, Mfg. & Oil Supply Dept., Arabian American Oil Co., 505 Pk. Ave., N. Y. 22, N. Y. (NY)
- ROTTMANN, ALWIN M.**, Pres., Realtec Corp., 202 W. Willow St., Wheaton, Ill. (CM)
- ROUSSEAU, GILLES**, Cost Engineer, Estimating Dept., Perini Quebec Inc., 550 Sherbrooke W., Montreal, P. Q., Canada.
- RUBIN, SAMUEL**, Transportation Analyst & Economist, 1201 Greenwich St., San Francisco 9, Calif. (SF)
- RUEMMER, ELSWORTH G.**, Supervisor, Estimating & Procurement, Central Engineering Dept., Colgate Palmolive Co., 300 Pk. Ave., N. Y. 22, N. Y.
- RUSSELL, FRANK M.** (Charter), Staff Estimator, Estimates Dept., AETRON, a Div. of Aerojet-General Corp., 410 Citrus Ave., Covina, Calif. 1425 Linda Vista Drive, Whittier, Calif. (SC)
- RUSSELL, JOHN M.**, Chief Estimator, Estimating Dept., McKee Head Wrightson Ltd., 16-26 Baltic St., London, E. C. 1, England. 43, The Ruffetts, S. Croydon, Surrey, England.
- SANDERSON, FRANK**, Chief Accountant, Accounting Dept., Controller's Div., Thiokol Chemical Corp., Redstone Div., Huntsville, Ala. 8903 Camille Drive, S. E., Huntsville, Ala.
- SANDLIN, LINDY S.**, Estimator, Estimating Operation Dept., Gen. Electric Co., Richland, Wash. Rt. No. 1-Box 228-A, Richland, Wash.
- SANDS, HAROLD F.**, Estimating Engineer, Estimating Dept., McKee Head Wrightson Ltd., 16-26 Baltic St., London, E. C. 1, England. 50 Cherry Tree Walk, Beckenham, Kent, England.
- SAYRE, PHILIP R.**, Technical Supt., Chemical Div., General Tire & Rubber Co., P. O. Box 68, Ashabula, Ohio (NO)
- SCHAFER, FORREST J., JR.** (Associate), Cost Controller, Project Control Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia, Pa.
- SCHALL, WILLIAM C.** (Associate), Asst. Editor, Chemical Engineering, McGraw-Hill Publishing Co., N. Y. 42nd St., N. Y. 36, N. Y. (NY)
- SCHERR, MELVIN F.** (Charter), Asst. Mgr., Foreign Sales Dept., Engineering & Construction Div., Koppers Co., Inc., 3018 Koppers Bldg., Pittsburgh 19, Pa.
- SCHWEHE, MILLARD F.**, Vice-Pres., Natkin & Co., P. O. Box 9188, Houston 11, Tex. (GC)
- SCHMIDT, RICHARD W.** (Charter), Technologist, Applied Research Laboratory, U. S. Steel Corp., Monroeville, Pa. (P)
- SCHOEFFLER, PAUL H.**, Project Engineer, Engineering Dept., Kaiser Aluminum & Chemical Corp., P. O. Box 1031, Baton Rouge, La.
- SCHRAISHUHN, EDWARD A.**, Supervisor, Operations Scheduling Dept., Socony Mobil (International), 150 E. 42nd St., N. Y. 36, N. Y. (NY)
- SCHWARTZ, CLARENCE C.** (Charter), Sr. Estimator, Cost Control Dept., Dow Chemical Co., 3836 Richmond Ave., Houston, Tex. (GC)
- SCHWEYER, HERBERT E.**, Prof., Chemical Engineering Dept., Univ. of Fla., Gainesville, Fla. 1115 N. W. 13th Ave., Gainesville, Fla.
- SCULLY, MICHAEL F.**, Capital Cost Engineer, Planning & Estimating Dept., American Viscose Corp., Walnut & Pine Sts., Marcus Hook, Pa. (DV)
- SEABURY, ALMON D.**, Plant Engineer, Engineering Dept., Pittsburgh Coke & Chemical Co., Neville Island, Pittsburgh 25, Pa. (P)
- SEARS, ROBERT C.**, Estimator, Estimating Dept., Bechtel Corp., Bechtel Corp., 220 Bush St., San Francisco, Calif. (SF)
- SECHREST, CHARLES H.**, Estimator, The C. W. Nofsinger Co., 307 E. 63rd St., Kansas City 13, Mo.
- SEEKINS, ADDISON W.** (Charter), Planning Engineer, Planning Dept., Pittsburgh Plate Glass Co., One-Gateway Ctr., Pittsburgh 22, Pa. (P)
- SELLERS, A. R.**, Estimator, Engineering Dept., Phillips Petroleum Co., 959 Adams Bldg., Bartlesville, Okla.
- SELTZER, DAVID** (Founder), Mgr., Proposal & Estimating Dept., The Lumnus Co., 146 Haynes Ave., Newark, N. J. (NY)
- SENGER, F. W.** (Associate), Engineer Estimator, Mfg. Dept., Tidewater Oil Co., Martinez, Calif. 3112 Concord Blvd., Concord, Calif.
- SEUFERT, MISS MARION B.** (Associate), Administrative Asst., Estimating Engineering Dept., Badger Mfg. Co., 363 Third St., Cambridge 42, Mass. (NE)
- SHANLEY, HERBERT E.** (Associate), Cost Estimator, Research & Development Dept., Distillers Co. Ltd., Great Burgh, Epsom, Surrey, England.
- SHANNON, CHRISTIE B.**, Engineer, Estimating—835, AETRON, A Div. of Aerojet-General Corp., 410 N. Citrus Ave., Covina, Calif. 21249 Mesarica Rd., Covina, Calif. (SC)
- SHAPIRO, JOSEPH S.**, Sr. Cost Engineer, Cost Engineering Dept., American Cyanamid Co., 30 Rockefeller Plaza, N. Y. 20, N. Y. 10 Cornell Lane, Hicksville, L. I., N. Y. (NY)
- SHAPIRO, ROBERT J.** (Charter), Sr. Project Engineer, Jacobs Engineering Co., 774 E. Green St., Pasadena, Calif. 1336 E. Workman Ave., W. Covina, Calif. (SC)
- SHEEHAN, E. W.**, Sr. Project Engineer, Engineering Dept., Inland Steel Co., Watling & Block, E. Chicago, Ind. 456 Lakewood Blvd., Pk. Forest, Ill. (CM)
- SHEHORN, WARREN E.** (Charter), Estimator, Engineering & Mechanical Div., Oak Ridge National Laboratory, P. O. Box "X", Oak Ridge, Tenn.
- SHELLENBERGER, DONALD J.**, Supervisor of Chemical Engineering Services, Research & Development Dept., Jones & Laughlin Steel Corp., 900 Agnew Rd., Pittsburgh 30, Pa. (P)
- SHIREMAN, C. G.**, Mgr. of Economic Analysis, Refining Div., Calif. Oil Co., 1200 State St., Perth Amboy, N. J. (NY)
- SHROFF, PETER D.**, Research Specialist, Quality Reliability, & Standards Dept., N. American Aviation Co., Autonetics, Lakewood Blvd., Downey, Calif. 6963 San Palo Circle, Buena Pk., Calif.
- SIAS, R. DOUGLAS**, Group Leader, Engineering & Construction Dept., The Dow Chemical Co., Midland, Mich.
- SILVIA, WILLIAM F.** (Associate), Cost Engineer, Construction Engineering Dept., Linde Co., Div. of Union Carbide Corp., P. O. Box 152, Tonawanda, N. Y. (NF)
- SIMMS, ROBERT E.** (Associate), Statistical Engineer, Executive Dept., General Telephone Co. of Fla., P. O. Box 110, Tampa 1, Fla.
- SIMON, FRANK J.**, Project Coordinator, Administration Dept., Paul Tishman General Co., 21 E. 70 St., N. Y. 102-32 65th Ave., Apt. B-45 Forest Hills 75, N. Y. (NY)
- SIMON, ROY A.** (Associate), Cost Estimator, Estimates Dept., AETRON, A Div. of Aerojet-General Corp., 410 N. Citrus Ave., Covina, Calif. (SC)
- SINGLER, EDWARD F.**, Sr. Estimator, Estimating Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia 2, Pa. 31 Red Rose Drive, Levittown, Pa.
- SKOGSTAD, TOR T.**, Mgr., Research Dept., The American Appraisal Co., 525 E. Michigan St., Milwaukee 1, Wis. (CM)
- SMITH, ALLEN G., JR.**, Asst. Mgr., Cost Dept., Uhl, Hall & Rich, 2620 Main St., Niagara Falls, N. Y. (NF)
- SMITH, ARTHUR A.**, Chief, Estimating & Cost Dept., Stone & Webster Engineering Corp., 49 Federal St., Boston 7, Mass. (NE)
- SMITH, B. FRANK, JR.** (Charter), Supervisor, Research & Technical Dept., Texaco Inc., P. O. Box 1499, Port Arthur, Tex.
- SMITH, CHARLES A.** (Founder), Applications Planner, Data Processing Dept., Celanese Corp. of America, Chemical Div., P. O. Drawer 561, Corpus Christi, Tex.
- SMITH, CLAYTON F.**, Executive Asst., Research Planning Dept., General Chemical Div., Allied Chemical Corp., General Chemical Research Laboratory, Box 405, Morristown, N. J.
- SMITH, GERALD J.**, Vice-Pres., Estimating-Purchasing Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia 2, Pa. (DV)
- SMITH, R. WALLACE**, Cost Engineer, Cost Analysis Dept., The RAND Corp., 1700 Main St., Santa Monica Calif. 731 Almar Ave., Pacific Palisades, Calif.
- SMITH, REGINALD J.**, Chief Estimator, Estimating Dept., Matthew Hall & Co. Ltd., Matthew Hall House, 26/28 Dorset Square, London, N. W. 1, England. 124 Cherry Tree Rd., Beaconsfield, Bucks, England.
- SMITH, ROGER A.**, Design Engineer, Estimates 835, AETRON, A Div. of Aerojet-General Corp., 410 N. Citrus Ave., Covina, Calif. (SC)
- SMITHSON, JOHN H.** (Charter), Asst. Director, Technical & Economic Evaluation Dept., Chemical Div., Celanese Corp. of America, 180 Madison Ave., N. Y. 16, N. Y. (NY)
- SMITS, JOHANNES A.**, Marketing Operations Dept., Shell International Petroleum Co. Ltd., St. Helen's Court, London, E. C. 3, England. 24 Beeches Walk, Carshalton, Surrey, England.
- SNELSON, WILLIAM M.** (Associate), Pres., Snelson Plumbing & Heating Co., 506 W. State St., Sedro-Woolley, Wash.
- SOBEY, ROMAN P.**, Survey & Cost Engineer, Construction Dept., Shumavon & Buckley, Consulting Engineers, 145 E. 32nd St., N. Y. 16, N. Y. 2805 Pond Place, Bronx 58, N. Y. N. Y. (NY)
- SOHNS, VIRGIL E.** (Associate), Chemical Engineer, Engineering & Development Laboratory, Northern Utilization Research & Development Div. of USDA, 1815 N. Univ. St., Peoria, Ill.
- SOMMERS, PAUL H.**, Contract Mgr., Heavy Construction Div., Blount Brothers Construction Co., 79 Commerce St., Montgomery, Ala.
- SOMPI, THEODORE S.** (Founder), Chief Engineer, Plant Engineering Dept., Diamond Alkali Co., P. O. Box 430, Painesville, Ohio. 634 Liberty St., Painesville, Ohio.
- SPOOR, DONALD F.** (Charter), Engineering Estimator, Engineering Dept., The Northwest Paper Co., Cloquet, Minn.
- SPRINGFIELD, CHARLES E.** (Charter), Sr. Estimator, C. F. Braun & Co., 1000 S. Fremont Ave., Alhambra, Calif. 895 Grandridge Ave., Monterey Pk., Calif. (SC)

- SQUIRES, VERNON C.**, Central Engineering Staff, Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio. 897 Stadelman Ave., Akron 20, Ohio. (NO)
- STAFFORD, RALPH D.**, Sr. Project Evaluator, Program Planning Dept., B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland 15, Ohio. (NO)
- STAMPS, HAROLD F.**, Project Mechanical Engineer, Mechanical Dept., DeLew, Cather & Co., 150 N. Wacker Drive, Chicago 6, Ill. (CM)
- STANFORD, CHARLES P.**, Cost Engineer, Electrochemicals Dept., E. I. du Pont de Nemours & Co. Inc., Du Pont Bldg., Rm. 4083, Wilmington 99, Del. 1 Van Dyck Drive, Wilmington 3, Del.
- STEINMETZ, EMIL H.**, Estimating Engineer, Girdler Construction Div., Chemetron Corp., P. O. Box 174, Louisville, Ky.
- STELLY, WILFRED**, Construction Engineer, Central Management Construction Dept., The Lummus Co., 146-246 Haynes Ave., Newark 5, N. J.
- STEMPSON, MATTHEW B.**, Cost Engineer, Estimate & Construction Dept., Jackson & Moreland, Inc., 600 Pk. Square Bldg., Boston 16, Mass. (NE)
- STEPHAN, ROBERT W.**, Project Chemical Engineer, Chemical Laboratories, Bituminous Coal Research, Inc., 121 Meyran Ave., Pittsburgh 13, Pa. 30 Haberman Ave., Pittsburgh 11, Pa. (P)
- STEPHENSON, GEORGE B.**, Cost Administrator, Procurement Dept., Convair-Astronautics, A Div. of General Dynamics Corp., P. O. Box 1128, San Diego 12, Calif. 2121 Cardinal Drive, San Diego 11, Calif.
- STERN, ARTHUR L.**, (Founder), Partner, Arthur L. Stern Co., 511 Melrose Place, S. Orange, N. J.
- STEVENSON, RICHARD H.**, Chief Engineer, Engineering Div., Sumner Sollitt Co., 307 N. Michigan Ave., Chicago 1, Ill.
- ST. JOHN, RICHARD A.**, (Associate), Technologist, Metallurgical Dept., National Lead Co. of Ohio, P. O. Box 39158, Cincinnati 39, Ohio.
- STRAHLE, WILLIAM T.**, Plant Engineer, Engineering Dept., W. R. Grace & Co., Dayvion Chemical Div., P. O. Box BB, Lake Charles, La.
- STRAGE, HENRY M.**, Engineer, Chemical Engineering Dept., Singmaster & Breyer Co., 420 Lexington Ave., N. Y. 17, N. Y. 454 Riverside Drive, N. Y. 27, N. Y.
- STRANSKY, ORRIN J.**, Director of Cost Engineering, Cost Dept., Stearns-Roger Mfg. Co., 660 Bannock St., Denver 17, Colo. 1243 Poplar St., Denver 20, Colo.
- STRATHKOTTER, ARTHUR V.**, Sr. Estimator, Cost Engineering Dept., Ralph M. Parsons Co., 617 W. 7th St., Los Angeles 17, Calif. (SC)
- STRIMLAN, CHARLES V.**, Asst. Mgr., Estimating & Budgeting Sect., Engineering & Construction Div., Koppers Co. Inc., Grant St., Pittsburgh 19, Pa. (P)
- STUART, JERRY H.**, Chief Design Engineer, Design Engineering Dept., Merck Sharp & Dohme Co., West Point, Pa. (DV)
- SUAREZ, RAYMOND J.**, Cost Engineer, Cost & Estimating Sect., Tenn. Valley Authority, 406 Arnsfeld Bldg., Knoxville, Tenn. 5312 Montrose Drive, Knoxville 18, Tn.
- SULLIVAN, CHARLES G.**, (Charter), Cost Engineer, Coordinating & Construction Dept., The Lummus Co., P. O. Box 22105, Houston 27, Tex.
- SUMMERS, FRANK V.**, Process Economics Engineer, Silicone Products, General Electric Co., Waterford, N. Y. 25 Fredericks Rd., Scotia 2, N. Y.
- SUNNERGREN, CARL E.**, Project Engineer, Engineering Dept., Pittsburgh Coke & Chemical Co., Neville Island, Pittsburgh 25, Pa. (P)
- SUOMU, ELMER J.**, Cost Engineer, Central Engineering Dept., W. R. Grace & Co., Dewey & Almy Chemical Div., 62 Whittemore Ave., Cambridge 40, Mass. (NE)
- SURTEES, RUSSELL C.**, Development Engineer, Development Dept., Canadian Industries Ltd., P. O. Box 10, Montreal, Quebec, Canada.
- TAYLOR, CLYDE C.**, Project Engineer, Engineering Dept., Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio. 7245 Hart St., Mentor, Ohio. (NO)
- TAYLOR, DENNIS M.**, Sales Mgr., Commercial Dept., McKee Head Wrightson Processes Ltd., 16/26 Baltic St., London E. C. 1, England. 33 Gigg's Hill Gardens, Thames Ditton, Surrey, England.
- TEMPLETON, ROBERT E.**, Financial Analyst, Controller's Div., The M. W. Kellogg Co., 711 3rd Ave., N. Y. 17, N. Y. 34 Stockton Rd., Summit, N. J. (NY)
- TESNER, HENRY D.**, Specification Writer, Engineering & Construction Services, Dow Chemical Co., 3636 Richmond St., Houston, Tex. 6272 Piping Rock Lane, Houston 27, Tex. (GC)
- THIELHELM, HAROLD W.**, Coordinator, General Office Engineering Dept., Arabian American Oil Co., Dhahran, Saudi Arabia.
- THOMAS, ERWIN F.**, (Associate), Electrical Engineer, Electrical Dept., DeLew, Cather & Co., 150 N. Wacker Drive, Chicago, Ill. 5150 S. Honore St., Chicago 9, Ill. (CM)
- THOMASON, NORMAN S.**, Cost Engineer, Design & Construction Dept., Ebaco Services, Inc., P. O. Box 573, Helena, Ark.
- THOMPSON, F. B.**, (Charter), Chief Estimator, Estimating Dept., Southwestern Engineering Co., 4800 Santa Fe Ave., Los Angeles 58, Calif. 9048 Via Amorita, Downey, Calif. (SC)
- THOMPSON, ROBERT L.**, Engineering Administrator, Engineering Dept., Kraft Div., West Virginia Pulp & Paper Co., P. O. Box 832, Charleston, S. C.
- THOMPSON, WILLIAM R.**, (Charter), Kellogg International Corp., 7-10 Chandos St., London, W. 1, England.
- THORNBURG, A. Z.**, Supervisor, Estimating Dept., Consolidated Western Steel Div., U. S. Steel Corp., 5700 S. Eastern Ave., Los Angeles, Calif. (SC)
- THORNE, HENRY C. JR.**, Project Evaluator, Research Dept., Amoco Chemicals Corp., 130 E. Randolph Drive, Chicago 1, Ill. (CM)
- TILLQUIST, GEORGE E.**, Sinclair Petrochemicals, Inc., 600 Fifth Ave., N. Y. 20, N. Y.
- TINER, WAYNE D.**, Director of Research, Research & Methods Dept., H. B. Zachry Co., P. O. Box 21188, San Antonio 21, Tex.
- TONELLI, RALPH J.**, Executive Vice-Pres., Long-About Engineering Ltd., P. O. Box 1146, St. Laurent, P. Q. Canada.
- TOOMER, LAMAR C.**, (Charter), Accounting Service Supervisor, Finance & Materials Div., Union Carbide Nuclear Co., Oak Ridge, Tenn. 880 W. Outer Drive, Oak Ridge, Tenn.
- TRACEY, KENNETH**, Accounting-Cost Control Supervisor, Eastern Chemical Div., Hooker Chemical Corp., 47th & Buffalo Ave., Niagara Falls, N. Y. (NF)
- TRACY, W. E.**, W. E. Tracy Co., 4222 Richmond Ave., Houston 27, Tex. (GC)
- TRAUB, ALEXANDER S.**, Jr., General Construction Supt., Engineering Dept., Stauffer Chemical Co., Chauncey, N. Y. 3 Leawood Drive, Briarcliff Manor, N. Y. (NY)
- TRIPPET, GERALD E.**, Control Analyst, Contract Status Dept., Controller's Div., The M. W. Kellogg Co., N. Y. 17, N. Y. (NY)
- TROMM, CONRAD A. O.**, Cost Engineer, Cost Div.-Assessment Dept., Corp. of the Township of Toronto, Municipal Office, Cooksville, Ontario, Canada.
- TROSCLAIR, LUCIEN E.**, (Founder), Group Leader-Estimating, General Engineering Dept., Ethyl Corp., P. O. Box 341, Baton Rouge, La.
- TROTTER, WILLIAM T.**, Partner, J. A. Condon & Associates, Construction Consultants, 689 N. W. 45th St., Miami, 37, Fla.
- TRUX, ROBERT L. JR.**, Vice-Pres., Engineering & Estimating Dept., Hubbard Construction Co., P. O. Box 7217, Orlando, Fla.
- TSAROS, CONSTANTINE L. JR.**, Sr. Process Engineer, Institute of Gas Technology, 17 W. 34th St., Chicago 6, Ill. 4241 Howard Ave., Western Springs, Ill. (CM)
- TURNBILL, G. SCOTT**, Chief Engineer, Plant Engineering Dept., International Minerals & Chemical Corp., P. O. Box 71, Carlsbad, N. Mex.
- TWADDLE, WARREN W.**, Supervisor, Business Evaluation, Research Dept., Amoco Chemicals Corp., 130 E. Randolph Drive, Chicago 1, Ill. (CM)
- VALBY, JAMES S.**, Chief Cost Estimator, Cost Dept., Merritt, Chapman & Scott Corp., P. O. Box 296, Niagara Falls, N. Y.
- VANE, GEORGE C.**, (Charter), Sr. Estimator, Pricing & Estimating Dept., Atomics International Co., 8900 Deoto Ave., Canoga Park, Calif. (SC)
- VERGILIO, JOSEPH H.**, (Charter), Research Chemical Engineer, Mathematics & Economic Evaluations Dept., Texaco Inc., Texaco Research Ctr., P. O. Box 509, Beacon, N. Y.
- VESSEY, HAROLD M.**, (Charter), Chemical Engineer, Olefins Work Administration Dept., Union Carbide Olefins Co., Div. of Union Carbide Corp., P. O. Box 8004, S. Charleston 3, W. Va.
- WAGNER, RICHARD L.**, Valuation Engineer, Corporate Staff, Diamond National Corp., 733 Third Ave., N. Y. N. Y. Rustic Acres, Mountain Rd., Georgetown, Conn. (NY)
- WAHLSTROM, CARL J. H.**, Staff Engineer, Technical Div., Humble Oil & Refining Co., Baytown, Tex. Box 3048, Baytown, Tex.
- WAKEFIELD, MILTON C.**, Asst. Chief Engineer, Engineering Dept., Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio. 122 S. Belvoir Blvd., Cleveland 21, Ohio. (NO)
- WALDBILLIG, PERRY J.**, Architectural Engineer, Engineering Design Dept., Dept. of the Army, Corps of Engineers, 180 New Montgomery St., San Francisco, Calif. 20 Innan Ave., Kentfield, Calif. (SF)
- WALKER, GEORGE A.**, Sr. Engineer, Mfg. Engineering Dept., Shell Oil Co., 60 W. 50th St., N. Y. 20, N. Y.
- WALLACE, REGINALD E. B.**, Estimating & Standards Engineer, Engineering Dept., DuPont of Canada Ltd., P. O. Box 660, Montreal, P. Q. Canada.
- WALSH, HENRY P.**, Asst. Engineer of Sewer Design, Engineering Dept., The Metropolitan Sanitary District of Greater Chicago, 100 E. Erie St., Chicago 11, Ill. 8128 S. Sangamon St., Chicago 20, Ill. (CM)
- WAMPOLE, RAYMOND C.**, Production Engineer, Cost Engineering Dept., AC Spark Plug Div., Gen Motors Corp., 7929 S. Howell, Milwaukee, Wis. 7864 N. 55th, Milwaukee 23, Wis.
- WARD, JACK W.**, Vice-pres., Heavy Construction Div., Harbert Construction Corp., P. O. Box 1369, Birmingham, Ala. 123 N. Haardt Drive, Montgomery, Ala.
- WARD, ROGER E.**, Staff Industrial Engineer, Raw Materials Dept., Jones & Laughlin Steel Corp., 3 Gateway Ctr. Pittsburgh 20, Pa. (P)
- WARDREY, JETER E. JR.**, Chief Estimator-Oak Ridge Operations, Engineering Dept., The H. K. Ferguson Co., P. O. Box 982, Oak Ridge, Tenn.
- WARREN, ROBERT A.**, (Associate), Estimator, Mechanical Engineering Dept., Signal Oil & Gas Co., Houston Div., P. O. Box 5008, Houston 12, Tex. (GC)
- WATSON, JAMES D.**, Electrical Engineer, Hirsch Electric Co., 5543 Armour Drive, Houston, Tex. (GC)
- WEAT, LLOYD E. JR.**, Civil Engineer, Engineering Dept., Columbian Steel Tank Co., 1509 W. 12th St., Kansas City, Mo. 3817 E. 72nd St. Terr., Kansas City 32, Mo.
- WEAVER, JAMES B.**, (Founder), Director, Development Appraisal Dept., Atlas Powder Co., Wilmington 99, Del. (DV)
- WEBB, JOSEPH C. JR.**, Editor, Petro/Chem Engineer, Petroleum Publishing Co., P. O. Box 1589, Dallas 21, Tex.
- WEBBER, LAURANCE E.**, (Charter), Research Assoc. Prof. & Asst. Director, Engineering Experiment Station, Univ. of N. H., Durham, N. H.
- WEBER, ARTHUR H.**, Chief Estimator, Estimating Dept., Tellepsen Petro-Chem Constructors, P. O. Box 2536, Houston 1, Tex. (GC)
- WEGENER, HOWARD E.**, (Associate), Estimator, Proposal Div., The M. W. Kellogg Co., 711 Third Ave., N. Y. 17, N. Y.
- WEINBERGER, LEON N.**, Mgr., Estimating Dept., Process Plants Div., Foster Wheeler Corp., 666 Fifth Ave., N. Y. 19, N. Y. (NY)
- WEINWURM, ERNEST H.**, Prof. of Accounting, DePaul Univ., 25 E. Jackson Blvd., Chicago 4, Ill. (CM)
- WELSH, CHARLES B.**, Chemical Engineer, Process Development Dept., Research & Development Laboratory, Pennsalt Chemicals Corp., P. O. Box 4388, Philadelphia 18, Pa. 883 Crestline Drive, R. D. 3, Norristown, Pa.
- WEST, CHARLES R.**, Planning Supervisor, Planning & Estimating Dept., American Viscose Corp., Walnut & Pine Sts., Marcus Hook, Pa.
- WESTER, ALFRED B.**, Sr. Supervisor, Cost Study Group, Explosives Dept., du Pont Co., Repauno Process Laboratory, Gibbstown, N. J. 35 Jefferson Ave., Pitman, N. J. (DV)
- WETTERSTROM, J. H.**, Sr. Project Estimator, Pricing & Estimating Dept., Atomics International Co., P. O. Box 309, Canoga Park, Calif. 1026 Newton St., San Fernando, Calif. (SC)
- WEYERHAEUSER, FREDERICK T.**, (Associate) Supervisor, Cost Control & Planning, Production Dept., Wood Conversion Co., Arch St., Cloquet, Minn.
- WHITNEY, FRANK V.**, (Charter), Chief Economics Engineer, Engineering Dept., El Paso Natural Gas Co., P. O. Box 1492, El Paso, Tex.
- WIANT, ISAAC J.**, Div. Head, Proposal Div., Design Engineering Dept., The M. W. Kellogg Co., 711 Third Ave., N. Y. 17, N. Y. (NY)
- WILKINSON, WILLIAM**, Estimating Engineer, Engineering Dept., Shell Chemical Co. Ltd., Marlborough House, Great Marlborough St., London, W. 1, England. 26 W. Pk. Rd., Kew Gardens, Surrey, England.
- WILLIAMS, GEORGE W. JR.**, Mgr. Production Engineering Dept., Neville Chemical Co., Neville Island, Pittsburgh 25, Pa. (P)
- WILLIAMS, JOHN D.**, Architect-Engine-Estimator, Estimates Branch, Design Div. DPWO 12ND, U. S. Navy, Naval Facility, San Bruno, Calif.
- WILLIAMS, ROBERT L.**, Chief Estimator, Engineering-Estimating Dept., Brown & Root Ltd., 1030 4th St., Calgary, Alberta, Canada. 31 Glenview Crescent, S. W., Calgary, Alberta, Canada.

WILLIAMS, ROGER, JR. (Charter), Chairman of the Board, Roger Williams Technical & Economic Services, Inc., Box 426, Princeton, N. J.
WILSON, HAROLD M., Staff Construction Engineer, Asst. to Vice-Pres., Refinery & Chemical Dept., Bechtel Corp., 220 Bush St., San Francisco Calif. (SF)
WILSON, DR. PHILIP J., JR. (Founder), Chief Research Engineer, Applied Research Dept., U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
WILSON, WILLIAM F., Cost Engineer, Engineering Dept., Reserve Mining Co., Silver Bay, Minn., 53 Edison Blvd., Silver Bay, Minn.
WING, HAROLD F., Project Engineer, Project Engineering Dept., American Potash & Chemical Corp., 3000 W. 6th St., Los Angeles 54, Calif. (SC)
WINNER, GEORGE R., Mgr., Project Control Group, Catalytic Construction Co., 1528 Walnut St., Philadelphia 2, Pa. (DV)
WINNING, R. P., Acting Estimating Engineer, Construction Div., Ontario-Hydro Electric Power Commission, 620 Univ. Ave., Toronto, Ontario, Canada. 3233 Flynn Crescent, Erindale, Ontario, Canada.
WINTERS, CHARLES P. (Charter), Asst. Chief Estimator, Project Estimating Dept., C. F. Braun & Co., 1000 S. Fremont Ave., Alhambra, Calif. (SC)

WISSLER, L. KENNETH (Associate), Investment Accountant, Engineering Dept., E. I. du Pont de Nemours & Co. Inc., Louviers Bldg., Newark, Del.
WITHERSPOON, R. T., JR., Cost Engineer, Engineering & Development Dept., The Chemstrand Corp., Decatur, Ala.
WOJTKOWIAK, MICHAEL, Chief Cost Engineer, Industrial Div., Canadian Vickers Ltd., P. O. Box 550—Place D'Armes, Montreal, P. Q., Canada.
WOLFE, KENNETH G., Chief Estimator, Estimating Dept., Bechtel Corp., 220 Bush St., San Francisco 4, Calif. (SF)
WOODHEAD, G. F., Estimating Engineer, Estimating & Technical Expenditure Dept., British Petroleum Co. Ltd., BP House, Ropemaker St., London, E. C. 2, England.
WRIGHT, HARRY W., JR., (Associate), Cost Engineer, Wright & Kremers Inc., Pine & Main Sts., Niagara Falls, N. Y.
YANOFISKY, ROBERT, 64 Tennis Rd., Mat-tapan, Mass. (NE)
YOUSCH, THOMAS, Process Equipment Engineer, Pre-Contract Dept., Western Precipitation Div., Joy Mfg. Co., 1000 W. 9th St., Los Angeles 54, Calif. (SC)

ZACOVIC, JAMES J., Plant Evaluation Engineer, Engineering Dept., E. I. du Pont de Nemours & Co. Inc., Louviers Bldg., Wilmington 98, Del. (DV)
ZAHN, WARREN, Engineer, Engineering Dept., Socony Mobil Oil Co. Inc., 150 E. 42nd St., N. Y., N. Y. (NY)
ZEARFOSS, CLIFFORD E. (Charter), Chief Estimator, Estimating Dept., Hydrocarbon Research, Inc., 115 Broadway, N. Y. 6, N. Y. (NY)
ZEVIK, FRANCIS C., Sr. Service Engineer, Engineering Service Div., Engineering Dept., E. I. du Pont de Nemours & Co. Inc., Louviers Bldg., Wilmington 98, Del. (DV)
ZIMMERMAN, DR. O. T. (Founder), Prof. of Chemical Engineering & Chairman of Dept. of Chemical Engineering, Univ. of N. H., Durham, N. H.; Pres., Industrial Research Service, Masonic Bldg., Dover, N. H. (Latter Address)
ZINMAN, ABRAHAM L., Pres., A & B Zinman Inc., 45-23 21st St., Long Is. City 1, N. Y. (NY)
ZIRKEL, WILLIAM, Valuation Architect-Engineer, Engineering Dept., Walter R. Kuehn & Co., 22 W. Monroe St., Chicago 3, Ill. 936 Hinman Ave., Evanston, Ill. (CM)
ZNAMIEROWSKI, L., Engineer, Process Development Dept., Canadian Liquid Air Co., 1210 Sherbrooke W., Montreal, P. Q., Canada. 78 9th Ave., Roxboro, P. Q., Canada.

GEOGRAPHICAL INDEX*

UNITED STATES OF AMERICA

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John B. Charlton
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 Frank Sanderson
 Paul H. Sommers
 Jack W. Ward
 R. T. Witherspoon, Jr.

ARKANSAS

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* According to preferred address in instances of an interstate commute.

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J. Paul Huber
Ferdinand V. Marsik
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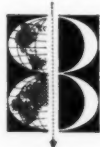
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